

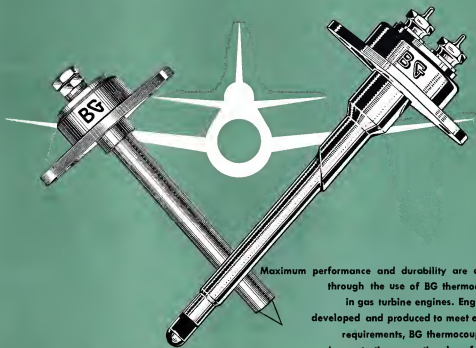
# AVIATION WEEK

A MCGRAW-HILL PUBLICATION

FEB. 16, 1953

50 CENTS

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July 16, 1952.

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We selected Kiddle apparatus only after we had conducted thorough tests of yours as well as other extinguishing equipment. Kiddle stood out as the outstanding performer.

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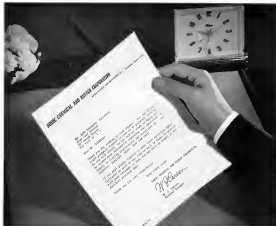
Sincerely,

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Superintendent of Maintenance.

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## NEWS DIGEST

### Domestic

**Lear, Inc.**, is working on a low-cost, angleless lightplane cockpit designed to prevent inadvertent spin during instrument weather as a result of industry interest in an autospin device announced by Javelin Aircraft Co., Wichita, several months ago. Lear, which makes the L-3 three-axis autopilot for lightplanes, hopes to begin first flights of its own autospin device within 60 days.

National Security Agency procured 100,000 copies of Lear's model, recalled \$1,990,000 for U. S. air bases in Taiwan. North Africa MSA purchased 511,770,000 for aviation gasoline and \$220,000 for lubricants and propellant. General procurement authorization of \$22,657,000 was approved for defense spending in Austria, France, French North Africa, French overseas territories and Tunisia.

Ryan Aeronautical Co. has received an estimated \$15 million in new orders from Boeing Aircraft Co. under a continuing contract for C-97 Strato-cruiser sections, including "backlog orders at Ryan's Los Angeles factory to \$30 million.

Grand Central Aircraft Co. is developing and producing solid propellant jet motor engines at its new plant near Pomona, Calif. The Glendale, Calif., firm is manufacturing a new jet aircraft engine for the Navy.

Hydro-Aero, Inc., Burbank, Calif., manufacturer of aircraft accessories has set up a scholarship program for underprivileged students engineering, University of California at Los Angeles.

Comair uses complete suggestions as fitted on savings of \$6,551,460 at the Ft. Worth plant last year. Cash awards for the suggestions totaled \$17,625.12.

Richard S. Baerli, president of Fairchild Engine and Airplane Corp., recently was awarded a medal by a division headed down by the Manufacturers Aircraft Assn. on a pointed method of using exhaust gases and turned out to improve cooling and increase thrust of piston type engines.

Helicopter Assn. of America elected Carl Bonds, Economy Prost Control Yalisco, Wash., is president at the organization's recent annual meeting in Ft. Worth. Also named were Elmer Redick, Ken Coplan, Billie



**FLETCHER PD-25** biplane, light biplane design, is pictured being built in disassembly by Fletcher where it will be used as a demonstrator and to test production of the plane by Yalisco Aircraft Co., Japan.

Flies include checking out Japanese pilots in the plane. The PD-25 is designed to take off in 100 ft., with full load and land in 150 ft. Cruise speed is about 1800 mph.

field, Calif., secretary, and H. A. Bach, Helicopter Air Service, Inc., Chicago, treasurer.

Charles S. Logsdon, National Aeronautics Assn. General Division director and leading U. S. authority on inter national aircraft records, has been named assistant secretary and assistant treasurer of NAA, according to the late Miss Mae Simpson.

Daniel Gurney, vice president and engineering director of Martin Rockwell Corp., Lancaster, N. Y., died Feb. 3. The 52-year-old industrialist had served on the National Advisory Committee for Aeronautics.

Armed Services Technical Information Service (ASTIS) has opened an entire regional office in New York located at the Aircraft and Develop ment Command.

Maj. Gen. Arthur Thomas, commanding general of the Fourth Air Force, will retire from active duty Feb. 28 after more than 15 years' service. Thomas, World War II chief of the 17th Air Force Service Command, indicated the AF plan of having defense peace-operations exhibit units and components during schooling field.

### Financial

Gavco Corp., wholly owned subsidiary of General Aviation, reports record net savings of \$13,876.65 during the first eight months of the current fiscal year.

### International

Idahoexpans Heavy Industry, one of Japan's leading machine manufacturers, is scheduled to begin production soon of major exports for helicopters. First flight of a Japanese gyrocopter will be made in March or April, an IHI spokesman says.

Nakajima Aircraft's major work, broken into separate companies by Japan's postwar anti-monopoly law, are being merged into one place production organization, it is reported from Tokyo. Next step is the merger of Fuji Industry, Fuji Aircraft Industry, Osaka Fuji Industry and Tokyo Fuji Industry is inclusion in the expansion of Fuji Precision Industry.

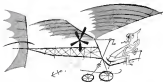
South African Airways is planning Johannesburg London flights of British Overseas Airways Corp. de Havilland Comet jet liners, ordered by South African crown, by next October.

De Havilland reports that aggregate flight time of Comets flown by the jet transport manufacturer, BDAC and Union Aeronautique de Transport (France) recently reached a total of 31,000 hr.

British aircraft manufacturers reported planes valued at about \$225,181,000 in 1952, the Society of British Aircraft Constructors reports.



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## AVIATION CALENDAR

- Feb. 15**—New York: Session of the International Society of Women Aired Staffs, New York, N. Y.
- Feb. 15-16**—English Annual Conference of the Society of Flight Instructors, Sunnyside Hotel, New York, N. Y.
- Feb. 15-16**—Texas Second Agricultural Aviation Conference, Texas A. & M. College, College Station, Tex.
- Feb. 15-16**—Canadian Panel of the Aircraft Industries Assn., Concord Hotel, Pt. March, Wis.
- Feb. 26**—May 2—Seventh annual Pacific Coast WingWings Spring Meet, Torrey Pines Glider Port, San Diego, Calif.
- Mar. 10-11**—Eleventh Annual Convention, Society of the Flight Instructors Canada Inc., Grand Hotel, Niagara Falls, Canada.
- Mar. 17-18**—11th Annual Medical Aviation Society of Civil Engineers (Aired Staffs) Detroit.
- Mar. 18-19**—Third Midwestern Conference on Flight Mechanics, University of Minnesota, Minneapolis.
- Mar. 18-19**—Institute of Radio Engineers National Convention, Waldorf Astoria and Grand Central Palace, New York, N. Y.
- Mar. 21-22**—Fourth Western Metal Technicians and Composites, San Francisco Airfield, Los Angeles.
- Mar. 22-23**—Congress of Civil Aviation Conference, a joint meeting of trade and government, House 50 rooms of various airports, American Association of Airport Executives in holding annual meeting, Washington, Kansas City, Mo. Convention continues tomorrow, Room C, Hotel P. O. Box 201, Kansas City 41, Mo.
- Mar. 23-24**—National Production Forum of the AIAA, Hotel Statler, Cleveland, O.
- Mar. 24**—Apr. 2—Five International, Vagabond International, National Guard Armory, Washington, D. C.
- Apr. 4-12**—Second Annual International Motor Sports Show, Grand Central Palace, New York, N. Y.
- Apr. 20-21**—National Production Forum, National Aeronautic Museum and Aircraft Engineering display (SAE), Grand Central Palace and Hotel Statler, New York, N. Y.
- Apr. 20**—May 2—Annual Conference of Technical Committees, International Air Transport Assn., Grand Hotel, San Juan, Puerto Rico. Helicopter Symposium will be a principal feature.
- Apr. 25**—May 2—First annual National Transcontinental Handicap Air Cruise for private plane of 500 by or less, Philadelphia to Ft. Worth, Calif., sponsored by Philadelphia Junior Chamber of Commerce.
- Apr. 29**—May 1—1951 Electronics Components Symposium (AIEEE), Statler-Hilton Club, Pasadena, Calif.

### PICTURE CREDITS

1.—Flighter Aviation, 4.—Germany, DDF, 10.—USA, 11.—USA, 12.—USA, 13.—USA, 14.—USA, 15.—USA, 16.—USA, 17.—USA, 18.—USA, 19.—USA, 20.—USA, 21.—USA, 22.—USA, 23.—USA, 24.—USA, 25.—USA, 26.—USA, 27.—USA, 28.—USA, 29.—USA, 30.—USA, 31.—USA, 32.—USA, 33.—USA, 34.—USA, 35.—USA, 36.—USA, 37.—USA, 38.—USA, 39.—USA, 40.—USA, 41.—USA, 42.—USA, 43.—USA, 44.—USA, 45.—USA, 46.—USA, 47.—USA, 48.—USA, 49.—USA, 50.—USA, 51.—USA, 52.—USA, 53.—USA, 54.—USA, 55.—USA, 56.—USA, 57.—USA, 58.—USA, 59.—USA, 60.—USA, 61.—USA, 62.—USA, 63.—USA, 64.—USA, 65.—USA, 66.—USA, 67.—USA, 68.—USA, 69.—USA, 70.—USA, 71.—USA, 72.—USA, 73.—USA, 74.—USA, 75.—USA, 76.—USA, 77.—USA, 78.—USA, 79.—USA, 80.—USA, 81.—USA, 82.—USA, 83.—USA, 84.—USA, 85.—USA, 86.—USA, 87.—USA, 88.—USA, 89.—USA, 90.—USA, 91.—USA, 92.—USA, 93.—USA, 94.—USA, 95.—USA, 96.—USA, 97.—USA, 98.—USA, 99.—USA, 100.—USA, 101.—USA, 102.—USA, 103.—USA, 104.—USA, 105.—USA, 106.—USA, 107.—USA, 108.—USA, 109.—USA, 110.—USA, 111.—USA, 112.—USA, 113.—USA, 114.—USA, 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Ducting ducting	✓
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## WHO'S WHERE

### In the Front Office

**Myron E. Dunham**, former vice president of Tumbull Engine and Airplane Corp., has been appointed president of Flight Technology, Inc. G. E. Wood Humphrey is chairman of the board of directors of the new American manufacturer of the British pulse and engine system for aircraft engine testing.

**Don Robert J. Smith**, president of Pacific Air Lines, has been named a member and deputy chairman of the board of directors of the Federal Reserve Bank. He succeeds Robert B. Anderson, who resigned to become Secretary of the Navy.

**Al Kneare** has been named president of American Shoppers, Inc., domestic wholesaler of food products in Los Angeles. Kneare and Glenn F. Miller, vice president sales manager, also were named to the company's board of directors.

**G. Robert Haggis** has been appointed executive vice president of Southern Air Lines. David Morris has been named assistant director of Bureau of Aeronautics.

**E. W. Higgins**, former General Secretary of the I. A. T. U., has been elected vice president of corporate affairs for Western Union Electric Corp., Pittsburgh. James C. Fink has been appointed senior design manager of Westinghouse Electric, nuclear and transportation, and Alexander Shoroff has been named supervisor of aviation and transportation in New York.

**H. B. Rorer** has been named chairman of the board of directors of Air America, Inc., Toronto, N. Y. New members of the board are J. E. Adams, president, W. H. Frank, and A. S. Miller.

**Matthew J. Bailey** and **George J. Finkler** have been appointed vice presidents of Annapolis Corp., Baltimore, Md.

**Hugh F. Cohen** has been named vice president and treasurer of Consolidated Engineering Corp., Pasadena, Calif.

**Cliff Bartholomew**, co-founder and executive head of Bartholomew & McHenry, has been named in 1946, has returned to Los Angeles from a year's leave and director Glenn E. Oldfield has been elected a director.

**William H. Stedman** has been appointed vice president/manufacturing for Stevens Products Corp., Auburn, N. Y.

**Paul E. Keller** has been named vice president of Support Tube Co., Norwalk, Conn.

### Changes

**Condon Wagon** has been appointed general manager of American Air Service, Channahon, N. Y.

**William Dwyer** has been promoted to director of manufacturing for Francis Highcopter Corp., Melrose, Pa. Neil L. Stohs has been named director of production control.

**Harold Elliot J.**, executive vice president of Equity Corp., New York, has been (Continued on page 51)

## INDUSTRY OBSERVER

Manufacturers of jet engines for USAF are maintaining delivery schedules, but piston engine deliveries are lagging due to failure of automobile manufacturers to get into production on schedule. Chevrolet's record in building Wright R-1500s as a substitute aircraft, but Ford, Nash, Acura and Locomotive are lagging on their piston engine production programs.

Remitt Airways is anxious to get a Navy AN/AP-42 navigation and store wiring airborne radar for use on routes down the west coast of South America. Two motion requests to the Secretary of the Navy have produced no results to date.

Vickers V-1000 jet transport is designed for a maximum gross weight of 180,000 lb for domestic use and 225,000 lb for an international (longhaul) version. Thrust of the Rolls-Royce Conway for the V-1000 initially will be 9,500 lb, eventually increased to 11,500 (Aviation Week Feb. 9, p. 11 and p. 16).

An Coordinating Committee panel on air traffic control and navigational aids is expected to report in 1963 on the best approach to speed for a typical helicopter with a gross weight of 10,000 lb and 100 ft per minute. This speed would enable a single engine helicopter to continue its descent at maximum rate-of-descent speed in event of power failure, while a two-engine rotor could complete its landing at the best possible speed for single-engine operation.

Production of B-100 in swept wings of Transonic speeds is so serious that aircraft manufacturers have made a joint technical representation to NACA for a special research project to investigate B-100 and recommend possible solutions.

First flight tests of the fifth Convair Chopped Wing aircraft are scheduled for March, about three months later than originally planned. The fifth model is a modified Convair Regularity twin engine piston. It is now being completed at Buena Vista, Fla., plant under license from the Convair Chopped Wing Corp. of Hagerstown, Md. For use of the patented chopped wing arrangement which is used at flying record sets.

New safety specifications for airport landing leaders are being prepared by the air transport section of the National Safety Council and are expected to be ready for submission to airlines companies and other interested parties this spring.

USAF still is pressing Hughes to sell the electronic portion of Hughes Aircraft Co., but a high selling price is far less than hoped for. Hughes is a major electronics manufacturer in the world because of its ability to produce, but several other manufacturers, including Lockheed and Convair, are interested. USAF is worried about production of aircraft parts and so on in the market, in which Hughes is a sole supplier for the aircraft portion of Air Force equipment development.

USAF has awarded Douglas Aircraft Co. another large order for C-119 (DC-68) transports. Latest C-119 order is for about 100 aircraft to be completed primarily for modernization of Military Air Transport Service fleets.

New alloys developed in Britain for housing of transistors and other high temperature materials are reported to contain comparatively small amounts of lead and contain good mechanical properties with high resistance to oxidation at elevated temperatures.

Competition for U.S. (Westinghouse) space producers is seen in emerging activities of Japanese in this field, with at least three firms bidding for a piece of the market here as well as price and low landed locations of the material.

## Defense Reorganization

President Eisenhower faces a tough decision on reorganization of Defense Department. There are two ways to do this job.

### • Ask Congress for direct legislation

This way, the President isn't likely to get near the congressional legislation. It probably would have never seen any strong and qualifications tucked into it. That has happened in the past.

After years of congressional wrangling, the 1947 United States Act was reorganized legislation a little under 10 years ago.

In 1949, again after much congressional wrangling, congressional legislation regarding the Uniformed Act was created. This did not thoroughly settle matters, either. Congressional legislation would be handled by the armed services committees, where each service position has strong support.

Particularly, if Eisenhower, in respect to congressional legislation, has received a number of the Defense Secretary, his reorganization legislation faces a wide future as Congress. Supporters of all three services probably would gain force and succeed in winning it down. It would take only a one vote margin to defeat an Eisenhower proposal in the committee, or in the flow of either house.

### • Submit a reorganization plan to the President

This way, odds would be in favor of the President would accomplish an bill the reorganization be granted. But it would be at the expense of integrating congressional groups, particularly the armed services committees whose support is important to the success of the defense program.

A reorganization plan would become effective unless vetoed in 60 days by a constitutional majority of either house. There would be no opportunity to tack on amendments.

The reorganization plan would be handled by the government operations committee where the services are the less influential than in the Armed Services Committee. These committees, most important, will be selected to go along with the President.

## New JCS Chairman?

There is a strong possibility that a United States Navy man is chairman of the Joint Chiefs of Staff when Gen. Omar Bradley's term expires in August.

House Armed Services Committee Chairman Dennis, Short explained: "It is the intention of Congress that the chairmanship should rotate. The Navy, in the same service, is next in line. I want an admiral as chairman."

Top contenders: Adm. Arthur Radford, commander of the Pacific Fleet.

An Air Force might fight the appointment. As Vice Chief of Naval Operations, Radford was a leader of Naval opposition to the B-36 strategic air program in 1946 and bitterly opposed Defense Department modifications in 1947.

## Naval Air Switch?

Deputy Chief for Naval Air, Vice Adm. Matthew Gandy, is under consideration for transfer to Deputy Chief for Operations. Vice Adm. James Tate, Jr., present Deputy Chief for Operations, will remain on duty two years' shore duty in July and is due for sea duty.

Worked in a possible increase to Gander.

• Vice Adm. John Bell, who has acted as an commander with the Atlantic Fleet for the past two years.

## CAB, CAA Reorganization

• Commerce Secretary Harold G. Wells, who will have an important voice in any reorganization of Civil Aeronautics Administration, wants to proceed cautiously. He told senators: "I think we will go along as we are at present. I am not going to change anything unless in my judgment I think it will be a change for the better."

• Top-ranking members of Senate Interstate and Foreign Commerce Committee have drafted legislation abolishing CAB and turning air transport regulation over to IACC. It is being held up for introduction until and if IACC adequately would have been reorganized, a committee study. It may be dropped in the longer, however, as an indication of dissatisfaction with the Board.

## People

• Rep. William Hall, who will head up the on-going subcommittee of House Armed Services Committee, plans to draft off a review of progress on standardization of military equipment. They report the subcommittee has received numerous complaints of confusion in the award of contracts which will be investigated.

• John Courtney, former Washington attorney who served during the war with Justice and Navy Department, will continue as counsel of the on-going committee, headed last year by Rep. Edward Robert. Robert is making research member this year.

• Rep. Allen O'Connell, who has carried on a running battle with House J. Kenna over the award of aircraft contracts to Kona Air Corp., has been named to the Armed Services Committee with jurisdiction over the matter. O'Connell wasn't a member of the committee last year. In floor speeches, he urged the committee to launch a full-scale investigation of Kona defense contracts. As a member, he may exert more influence.

• Sen. Everett Dirksen is chairman of the Judiciary Subcommittee, assigned investigation of alleged political influence in the appointment of high-level officials to lead captured coasters. Sen. Alexander Wiley wants the group to start off with General Andrew Price and Gen. Corder. headed by former TWA President Jack Pendergast was a member of the House select committee to investigate aircraft accidents in the early 1940s, under the chairmanship of the late Rep. Jack Nichols. After his defeat for reelection to Congress, Nichols became a TWA Vice president, serving under Pendergast.

• Sen. Edward Tyng, now chairman of the Senate Select Resources Committee, like last year's chairman, Sen. John Sparkman, has been reappointed to the committee. In floor fight with the scheduled reform industry. The outlook in the committee will contrast to defend the combat position. Sparkman is seeking minority influence.

• Laurence Henderson, who in contact, has done quite well for the Small Business Committee as supporter of the small and medium-sized firms to keep the post in March to serve with Mutual Security Agency.

• Assistant Secretary at Navy for Air John Philip probably will return to Chicago for practice in time for the coast season in the fall.

—Katherine Johnson



F4U ALL-WEATHER FIGHTERS silhouette of Japan's defense force, fly around the clock, pitch against possible Red bomber raids.

## Report From Japan

# USAF Tightens Japanese Air Defenses

- **Buildup of combat planes, bases and radar network gives our forces muscle to stop Red air violations.**
- **Air Force is revealed prepared to drop A-bombs on Communist bases immediately, if orders are issued.**

By R. P. (Peggy) Martin  
(McGraw-Hill World News)

Headquarters, Japan Air Defense Force—The United States has its own Mating when it seemed Russia that destroyed violations of Japan's air borders no longer would be tolerated.

Until a few weeks ago, that warning would have been only a threat without a punch to back it up. Now the situation is changed. Japan's air defense has come from a base distinct to a muscular fighting force.

The expansion was logical and inevitable. The Soviet Union has been harassing Japan by a war of nerves. Bomber pilots brazenly flew over Japanese territory several times a week, at the feet of American power and treaty guarantees. Russian air fleets were stopped of course, Japan except for two squadrons of the 14th Wing, Group 11, Tama Maru, and two squadrons of the 34th Fighter-Interceptor Wing.

The 114th Air Division was activated in Japan in late 1950 with the primary mission of supporting the Fifth Air

Force. Japan's home islands, guarding more than 5,000 mi. of coastline. 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th.

New air bases have been built, others enlarged and underground storage constructed.

The Air Force is ready to carry out atomic bomb missions against Russian bases should the order be given.

• **Defense Buildup**—The story of this buildup starts in July 1948, shortly after the Communists swept across the 38th Parallel into South Korea. The sight of the Fifth Air Force, previously concentrated in the Tokyo camps at Yokota and Johnson Air Bases, shifted south to Iwakuni, in southern Japan, and later to Tama, Korea. Japan was stopped of course, Japan except for two squadrons of the 14th Wing, Group 11, Tama Maru, and two squadrons of the 34th Fighter-Interceptor Wing.

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• **Ready With A-Bombs**—Today a vast radar network, almost completely

Fort in Korea. The Fifth Air Force and A-1 command in Japan under the Commander, Fifth Air Force Base. By March 1952, both Fifth AF and the 11th AF had gained such success in that Gen. G. F. Worland, Far East Air Force commander, split the command and activated the Japan Air Defense Force.

A modest construction program was started in 1950 to build up the air defense structure. The network of bases Japan had constructed in World War II had been plundered under during the finalization of Japan. Although the Air Force effort was concentrated primarily on Korea, construction as Japan progressed slowly but perceptibly.

In March 1952, when appropriate funds became available, the program went into high gear. For the first time there was a clear-cut mission to provide for the air defenses of Japan and Korea, instead of support for U. S. Army divisions assigned to the defense of the Japanese home islands.

• **Radio Network**—Heart of the program is the radar network woven into an intricate pattern to fit the availability of Japan's topography. Hereafter, for instance, positions as designated by radar, but requires a radio net on both coasts because of the towering mountain range stretching the entire length of the island.

Consider World War II radar was

mounted in an emergency base. It is now being replaced with modern equipment. Backup equipment also is becoming available. New sites are being selected to provide maximum coverage. When completed, each site will be manned by three officers and 131 enlisted men. There will be solid protection against enemy planes coming in at 500 ft. or lower, the altitude where it is hardest to spot a landing force. Under ideal conditions, planes at 10,000 ft. can be spotted more than 160 mi. away and those at 30,000 ft. more than 130 mi.

One key station is at the extreme northern tip of Hokkaido, and another is on the eastern coast, opposite the Russian-occupied Kuril Islands and guarding the approaches from the Kuriles. The station is less than 200 miles from a Russian radar station. The northeastern station faces Hakodate, where the Russians have built up a powerful air complex.

Backing up the radar are ground-control intercept systems, built of ground plants to pick up and track enemy flights, and to control surface defense planes.

Linking all of the outlying stations with command centers is an elaborate system of communications, using air-ground links, FM, radio telephone and CW. Within minutes of detection of unidentified aircraft, interceptors can be airborne. If the threat against them can be quickly detected. Practice drills have been carried out at primary centers to test the capability of emergency aircraft-type systems.

In one month last year, the radar network, located more than 38,000 planes. In that month, only 111 planes tracked by one unit could not be identified within five minutes. Ninety-one of the 113 were identified shortly after, through flight plans. Fifteen were identified visually by fighter pilots. Of the two tracks remained completely unidentified and then may have been flights of geese.

**Newest Groups—Japan** is divided into three defense zones with an air division in the 7th, 11th and 14th Air Divisions to each. Each division headquarters has an "air defense control center" that coordinates radar reports and controls all American activity in the zone.

Each AD commander is responsible for defense of his area. He issues the orders to scramble interceptors when unidentified planes approach. His command post section the pilots to the target and issues the orders to "shoot to kill." If no air attack appears imminent, he orders "hold alert" and flies west to Air Defense Force headquarters, which is responsible for alerting all outlying units throughout Japan. He also oversees air-traffic units.



AIR FORCE F-54 INTERCEPTOR for the ML Top in stepped-up defense alert

A small room at ADF headquarters is the command's nerve center. The chief duty position of all coastal aircraft and their status, whether on ground alert, to reserve or inactive. The extent of Russian air activity on the coast and preceding days is available immediately. A large control room with coordinates covers an entire wall and ready for plotting unidentified aircraft approaching Japan.

That air defense operations center is the last before the three air divisions and other defense units, including the Navy, Fifth Air Force, First Marine Air Wing, IJAF, XVI Corps, USAF, and 2nd Air Force on Okinawa. Here the division would be made to alert all relative units, to include fighters from one division to another, and to alert Fifth and 2nd Air Forces to the possibility that additional planes might be needed in Japan.

**Task Operations—Maj. Gen. Delmer T. Speyer**, while he was commanding general of JADF, permitted the Army and Navy that efficient defense of Japan, required clear teamwork. The Army brought the idea into a division guard on movement in the field spent years been trying to integrate JADF for clear support. The Navy was somewhat more cooperative of his so other units than the fact it used those bases and understood the requirements of aircraft control and warning.

New XVI Corps and the Navy have Japan officers at JADF headquarters. Joint Operations Center has been established on a steady basis at an official new Tokyo to coordinate operations with all Army units in Japan.

Navy high commissions calling of the port area JADF headquarters are under orders to leave the communication system. Four months ago, Navy air was integrated into the defense system. Second USF channels are assigned 24 hours a day and certain defense planes can be assigned to the danger zone if they are needed.

A fast center task force could not have carried out joint maneuvers with the Air Force 18 months ago. Now it is a more efficient and efficient.

**JADF Major JADF** has an own place specially assigned to the defense of Japan. They are no longer the reserve for Korea. Pilots sent here for training go into either the 35th Fighter Interceptor Wing, or the 27th Fighter Escort Wing, rather than the Fifth AF. The power is made up of F-84s, F-84Gs, F-84Hs, F-84J, F-84K, F-84L, F-84M, F-84N, F-84P, F-84Q, F-84R, F-84S, F-84T, F-84U, F-84V, F-84W, F-84X, F-84Y, F-84Z, F-84AA, F-84AB, F-84AC, F-84AD, F-84AE, F-84AF, F-84AG, F-84AH, F-84AI, F-84AJ, F-84AK, F-84AL, F-84AM, F-84AN, F-84AO, F-84AP, F-84AQ, F-84AR, F-84AS, F-84AT, F-84AU, F-84AV, F-84AW, F-84AX, F-84AY, F-84AZ, F-84BA, F-84BB, F-84BC, F-84BD, F-84BE, F-84BF, F-84BG, F-84BH, F-84BI, F-84BJ, F-84BK, F-84BL, F-84BM, F-84BN, F-84BO, F-84BP, F-84BQ, F-84BR, F-84BS, F-84BT, F-84BU, F-84BV, F-84BW, F-84BX, F-84BY, F-84BZ, F-84CA, F-84CB, F-84CC, F-84CD, F-84CE, F-84CF, F-84CG, F-84CH, F-84CI, F-84CJ, F-84CK, F-84CL, F-84CM, F-84CN, F-84CO, F-84CP, F-84CQ, F-84CR, F-84CS, F-84CT, F-84CU, F-84CV, F-84CW, F-84CX, F-84CY, F-84CZ, F-84DA, F-84DB, F-84DC, F-84DD, F-84DE, F-84DF, F-84DG, F-84DH, F-84DI, F-84DJ, F-84DK, F-84DL, F-84DM, F-84DN, F-84DO, F-84DP, F-84DQ, F-84DR, F-84DS, F-84DT, F-84DU, F-84DV, F-84DW, F-84DX, F-84DY, F-84DZ, F-84EA, F-84EB, F-84EC, F-84ED, F-84EE, F-84EF, F-84EG, F-84EH, F-84EI, F-84EJ, F-84EK, F-84EL, F-84EM, F-84EN, F-84EO, F-84EP, F-84EQ, F-84ER, F-84ES, F-84ET, F-84EU, F-84EV, F-84EW, F-84EX, F-84EY, F-84EZ, F-84FA, F-84FB, F-84FC, F-84FD, F-84FE, F-84FF, F-84FG, F-84FH, F-84FI, F-84FJ, F-84FK, F-84FL, F-84FM, F-84FN, F-84FO, F-84FP, F-84FQ, F-84FR, F-84FS, F-84FT, F-84FU, F-84FV, F-84FW, F-84FX, F-84FY, F-84FZ, F-84GA, F-84GB, F-84GC, F-84GD, F-84GE, F-84GF, F-84GG, F-84GH, F-84GI, F-84GJ, F-84GK, F-84GL, F-84GM, F-84GN, F-84GO, F-84GP, F-84GQ, F-84GR, F-84GS, F-84GT, F-84GU, F-84GV, F-84GW, F-84GX, F-84GY, F-84GZ, F-84HA, F-84HB, F-84HC, F-84HD, F-84HE, F-84HF, F-84HG, F-84HH, F-84HI, F-84HJ, F-84HK, F-84HL, F-84HM, F-84HN, F-84HO, F-84HP, F-84HQ, F-84HR, F-84HS, F-84HT, F-84HU, F-84HV, F-84HW, F-84HX, F-84HY, F-84HZ, F-84IA, F-84IB, F-84IC, F-84ID, F-84IE, F-84IF, F-84IG, F-84IH, F-84II, F-84IJ, F-84IK, F-84IL, F-84IM, F-84IN, F-84IO, F-84IP, F-84IQ, F-84IR, F-84IS, F-84IT, F-84IU, F-84IV, F-84IW, F-84IX, F-84IY, F-84IZ, F-84JA, F-84JB, F-84JC, F-84JD, F-84JE, F-84JF, F-84JG, F-84JH, F-84JI, F-84JJ, F-84JK, F-84JL, F-84JM, F-84JN, F-84JO, F-84JP, F-84JQ, F-84JR, F-84JS, F-84JT, F-84JU, F-84JV, F-84JW, F-84JX, F-84JY, F-84JZ, F-84KA, F-84KB, F-84KC, F-84KD, F-84KE, F-84KF, F-84KG, F-84KH, F-84KI, F-84KJ, F-84KL, F-84KM, F-84KN, F-84KO, F-84KP, F-84KQ, F-84KR, F-84KS, F-84KT, F-84KU, F-84KV, F-84KW, F-84KX, F-84KY, F-84KZ, F-84LA, F-84LB, F-84LC, F-84LD, F-84LE, F-84LF, F-84LG, F-84LH, F-84LI, F-84LJ, F-84LK, F-84LL, F-84LM, F-84LN, F-84LO, F-84LP, F-84LQ, F-84LR, F-84LS, F-84LT, F-84LU, F-84LV, F-84LW, F-84LX, F-84LY, F-84LZ, F-84MA, F-84MB, F-84MC, F-84MD, F-84ME, F-84MF, F-84MG, F-84MH, F-84MI, F-84MJ, F-84MK, F-84ML, F-84MM, F-84MN, F-84MO, F-84MP, F-84MQ, F-84MR, F-84MS, F-84MT, F-84MU, F-84MV, F-84MW, F-84MX, F-84MY, F-84MZ, F-84NA, F-84NB, F-84NC, F-84ND, F-84NE, F-84NF, F-84NG, F-84NH, F-84NI, F-84NJ, F-84NK, F-84NL, F-84NM, F-84NN, F-84NO, F-84NP, F-84NQ, F-84NR, F-84NS, F-84NT, F-84NU, F-84NV, F-84NW, F-84NX, F-84NY, F-84NZ, F-84OA, F-84OB, F-84OC, F-84OD, F-84OE, F-84OF, F-84OG, F-84OH, F-84OI, F-84OJ, F-84OK, F-84OL, F-84OM, F-84ON, F-84OO, F-84OP, F-84OQ, F-84OR, F-84OS, F-84OT, F-84OU, F-84OV, F-84OW, F-84OX, F-84OY, F-84OZ, F-84PA, F-84PB, F-84PC, F-84PD, F-84PE, F-84PF, F-84PG, F-84PH, F-84PI, F-84PJ, F-84PK, F-84PL, F-84PM, F-84PN, F-84PO, F-84PP, F-84PQ, F-84PR, F-84PS, F-84PT, F-84PU, F-84PV, F-84PW, F-84PX, F-84PY, F-84PZ, F-84QA, F-84QB, F-84QC, F-84QD, F-84QE, F-84QF, F-84QG, F-84QH, F-84QI, F-84QJ, F-84QK, F-84QL, F-84QM, F-84QN, F-84QO, F-84QP, F-84QQ, F-84QR, F-84QS, F-84QT, F-84QU, F-84QV, F-84QW, F-84QX, F-84QY, F-84QZ, F-84RA, F-84RB, F-84RC, F-84RD, F-84RE, F-84RF, F-84RG, F-84RH, F-84RI, F-84RJ, F-84RK, F-84RL, F-84RM, F-84RN, F-84RO, F-84RP, F-84RQ, F-84RR, F-84RS, F-84RT, F-84RU, F-84RV, F-84RW, F-84RX, F-84RY, F-84RZ, F-84SA, F-84SB, F-84SC, F-84SD, F-84SE, F-84SF, F-84SG, F-84SH, F-84SI, F-84SJ, F-84SK, F-84SL, F-84SM, F-84SN, F-84SO, F-84SP, F-84SQ, F-84SR, F-84SS, F-84ST, F-84SU, F-84SV, F-84SW, F-84SX, F-84SY, F-84SZ, F-84TA, F-84TB, F-84TC, F-84TD, F-84TE, F-84TF, F-84TG, F-84TH, F-84TI, F-84TJ, F-84TK, F-84TL, F-84TM, F-84TN, F-84TO, F-84TP, F-84TQ, F-84TR, F-84TS, F-84TT, F-84TU, F-84TV, F-84TW, F-84TX, F-84TY, F-84TZ, F-84UA, F-84UB, F-84UC, F-84UD, F-84UE, F-84UF, F-84UG, F-84UH, F-84UI, F-84UJ, F-84UK, F-84UL, F-84UM, F-84UN, F-84UO, F-84UP, F-84UQ, F-84UR, F-84US, F-84UT, F-84UU, F-84UV, F-84UW, F-84UX, F-84UY, F-84UZ, F-84VA, F-84VB, F-84VC, F-84VD, F-84VE, F-84VF, F-84VG, F-84VH, F-84VI, F-84VJ, F-84VK, F-84VL, F-84VM, F-84VN, F-84VO, F-84VP, F-84VQ, F-84VR, F-84VS, F-84VT, F-84VU, F-84VV, F-84VW, F-84VX, F-84VY, F-84VZ, F-84WA, F-84WB, F-84WC, F-84WD, F-84WE, F-84WF, F-84WG, F-84WH, F-84WI, F-84WJ, F-84WK, F-84WL, F-84WM, F-84WN, F-84WO, F-84WP, F-84WQ, F-84WR, F-84WS, F-84WT, F-84WU, F-84WV, F-84WW, F-84WX, F-84WY, F-84WZ, F-84XA, F-84XB, F-84XC, F-84XD, F-84XE, F-84XF, F-84XG, F-84XH, F-84XI, F-84XJ, F-84XK, F-84XL, F-84XM, F-84XN, F-84XO, F-84XP, F-84XQ, F-84XR, F-84XS, F-84XT, F-84XU, F-84XV, F-84XW, F-84XX, F-84XY, F-84XZ, F-84YA, F-84YB, F-84YC, F-84YD, F-84YE, F-84YF, F-84YG, F-84YH, F-84YI, F-84YJ, F-84YK, F-84YL, F-84YM, F-84YN, F-84YO, F-84YP, F-84YQ, F-84YR, F-84YS, F-84YT, F-84YU, F-84YV, F-84YW, F-84YX, F-84YY, F-84YZ, F-84ZA, F-84ZB, F-84ZC, F-84ZD, F-84ZE, F-84ZF, F-84ZG, F-84ZH, F-84ZI, F-84ZJ, F-84ZK, F-84ZL, F-84ZM, F-84ZN, F-84ZO, F-84ZP, F-84ZQ, F-84ZR, F-84ZS, F-84ZT, F-84ZU, F-84ZV, F-84ZW, F-84ZX, F-84ZY, F-84ZZ.

Base construction and improvement has been on a fairly elaborate scale. In addition on Hokkaido people JADF



RAILROAD GROUND control radar station ready for night warning of unidentified aircraft

with bases within 40 miles of Russian fields in the Kuriles and Sakhalin. Moreover, the big air base in northern Honshu, is capable of taking SAC's heavy bombers. A number of fields throughout Japan have been expanded and the runways lengthened. Two strips and airstrips have been added. More than 54 runways are expected for improvement of and potential runways at night usage bases. All construction was done by Japanese contractors.

A lot more is known about Russian strength in the Far East than it was a few months ago. Most of the 700 planes are believed to be based in two areas, a number that probably could be doubled. At least half of the 700 are believed to be MIG 15s. TU 16s, modified after the W2 Superfortresses, have been reported on Sakhalin, but no jet bombers have been sighted.

**Rad Radar Potential—**Japanese air forces, capabilities against Japan are considered limited, at least on the basis of current intelligence. Intelligence MIG 15s flying from Sakhalin and the Kuriles can reach Manchuria at base in northern Honshu. Control Japan, at least the Tokyo area, is just out of range of MIG 15s, which are based in Manchuria.

The TU 16s are made up of parts of Japan from the China mainland, Port Arthur, Vladivostok, or Sakhalin. But under the American report in Japan under the Russian want to provide as needed, they are still in place near the Japanese border since their value against American planes taking off from fields in Hokkaido.

The Japanese had two airfields in the Kuriles and 15 in the extreme southern end of Sakhalin. The Russians improved these and built new ones. They are the advance bases for the powerful couples on the Russian mainland.

The bases in the Kuriles have facilities to maintain three groups, while southern Sakhalin can support several more. Most of the 700 planes are believed to be based in those two areas, a number that probably could be doubled. At least half of the 700 are believed to be MIG 15s. TU 16s, modified after the W2 Superfortresses, have been reported on Sakhalin, but no jet bombers have been sighted.

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No one has yet would touch off JADF's control and warning system. A chain of modern air bases extending from Hokkaido to Koshu and around and facilities establishments, built in such a way that radar units of the Fifth Air Force could be transferred here and begin functioning almost immediately. Combined, these forces are considered powerful enough to cope with anything the Russians might throw at Japan.

**War Zone Operations—**JADF is far more than a defense force. Each air division has an Air Base Wing that runs all facilities and provides logistical support for other units, bases and ASA groups. It also supports and maintains Base Wing in Japan, provides logistical and logistical support for the Fifth Air Force and provides direct support of all planes from Korea and operates an air base for the First Marine Air Wing.

JADF carries out photo flights and reconnaissance. It has a radio collaboration system, a reconnaissance technical squadron that evaluates photographs, and an air and electronic squadron. It operates a 750-bed Air Force hospital in Nagoya and another hospital near Tokyo.

It also operates a number of technical schools for Far East Air Force. One of the largest is the Air Ground Operations school, where students study the Army school. The school has 100 officers and 100 enlisted men.

**Training Plans Off—**One of the most important schools in the training and maintenance of a reconnaissance technical squadron that evaluates photographs, and an air and electronic squadron. It operates a 750-bed Air Force hospital in Nagoya and another hospital near Tokyo.

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## Lightplane Sales

- Six companies delivered 3,058 aircraft in '52.
- Industry records first upswing since 1946 boom.

Shipments of 1278 utility aircraft valued at \$36,194,000 were reported by an U.S. manufacturers for 1952, showing an upward climb for the first year since the 1946 postwar boom.

Deliveries showed 12.9% over last year's 2,303 planes, while dollar value climbed sharply to 54.9% over last year's \$16,567,000, Joseph T. Gering, Jr., Utility Airplane Council manager, announced. Based on large backlog of certified lightplane orders on manufacturers' books and the upswing of last year, he predicted the upswing in plane sales will continue through 1953.

The civil aircraft upswing is in addition to increased production by the same companies for military aviation. Today, more than two-thirds of the total activity of lightplane companies is devoted to defense production, Gering estimated.

• **On the Shelf:** Hundreds of virtually all the shelf civil aircraft have been purchased as military liaison and trainer planes by the U.S. and members of the North Atlantic Treaty Organization. In one case, the entire initial production of a new executive aircraft designed for civilian use, the Beech Two-Business Model 56, was taken over by the Army. Manufacturers showed that Cessna Aircraft Co. continued its leadership in total aircraft production, with 1,371 planes valued at \$3,210,000. Of these, 1,183 were Model 171 171 four-place, four-seater aircraft valued at \$1,611,000, including 477 Super Cub's aircraft and 602 Piper four-places. Total dollar value of Piper's production was \$4,491,000.

Beech Aircraft Corp. ranked first in dollar volume with \$3,649,000. Beech delivered a total of 414 planes, including 156 Bonanza four-places, one Two-Business six-place, and 57 Two-Buck D18s.

• **Some New Competition:** A new company, Aero Design & Engineering Co., Oklahoma City, delivered 39 two-engine Aero Commander for dollar value of \$2,811,000.

Other deliveries included Mooney Aircraft 49 M19 nine-place, \$103,000; Taylorcraft, 15 two-place Sportster and five four-place Tourist, \$52,000. Two other one-place shipments were a Model E1 Encore valued at \$1,500 from Experimental Aircraft Co., and a Luscombe CO-1B valued at \$1,800.

• **Utilitarian Planes:** Significant was the



NORTHEAST Corsair crash landed Feb. 8 at La Guardia. Report of prop reversal pushed

## Prop Reversal Probed in Crash

Two planes of the continuing serious technical problem of inadvertent propeller pitch change in flight last week had seventh and eighth industry attention focused on them.

• **At La Guardia Field,** New York City, Civil Aeronautics Board investigators were checking the right Curtiss Electric propeller of a Northwest Airlines Constellation for indications of reversal after the pilot made an emergency crash-landing Feb. 8. Pilot reported the plane veered heavily to the right in an approach at 130 mph about 100 ft above the airport. No component of the plane was reported seriously injured.

• Meanwhile, representatives of federal agencies, airlines, engine pilots, and propeller manufacturers considered an investigation of a closed system over proposals for preventing inadvertent reversal of the hydraulic system of Hamilton Standard propellers and ensuring for Curtiss Electric propellers.

The Northwest La Guardia crash-landing, called up another case in favor of the passenger protective provided by the sturdy fuselage construction of the pressurized cabin Corsairs.

The plane hit the runway on the right

landing gear with such impact that the right wing was (thrust) off and folded back against the fuselage. The break point was near the root, ahead of the engine.

The plane swung into a 180-deg. yawing loop before coming to a stop in a nearby area 200 ft off the runway. It is believed the crash may have resulted part of the investigation. The passengers ejected without major difficulty and the accident was not complicated by adverse weather conditions or fuel losses.

First reports indicated the propeller blades had turned to very flat pitch, with only two degrees of positive pitch, but had not gone into full reverse. Complete reversal would be reached at a blade angle of 16.7 deg. negative, while normal low-pitch position has a blade angle of 26.3 deg. positive.

CAB investigators headed by Joseph Hart, New York, were not expected to make findings on the case until after further examination of the propeller blades and hub mechanism, checking the flight path, and interviewing the passengers. These passengers were reported to have suffered minor injuries in the accident.

fact that the total included purchase of 1,512 four-place and larger aircraft—downward of 40% of aircraft use in business, industry and agriculture. This contrasted with the boom year of 1946, in which 90% of the deliveries were two-place or smaller and the primary production was for low-horsepower planes and mostly in business and for sport flying.

Gering pointed out the upswing in small aircraft marketing had been delayed by the dearth of materials for civil aircraft production at the outbreak of Korean hostilities.

When materials restrictions were imposed, some companies—certainly

Boeing Aeronautical Division at the (New), Lancaster, Texas and Everett out of the personal pilot's license.

With the easing of material requirements, the first solid demand exceeding supply in several years is being met by continued production of the remaining components.

### Correction

A graph of 3,200 items of consumer goods of Air Equipment Corp. by John C. Markey, president, was incorrectly reported as a sale in the Jan. 26 issue of Aviation Week.



## Forged-in Quality means Longer Life for Eaton Valve-Seat Inserts

Eaton steel valve-seat inserts are made from hot-upset and pierced blanks. The forging process improves the physical characteristics of the steel, and provides superior wearing qualities in the finished inserts.

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ARMA's new Personal Computer shows a pilot his exact location and heading, continuously on a projected map—throughout a given flight. Here's how it works:

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frequency, automatically adjusts for scale of map and has provisions for automatic chart changing.

ARMA has worked closely with the Air Navigation Development Board and the Civil Aeronautics Administration in developing this Personal Computer for use in proposed advanced systems of air navigation and traffic control. For 15 years ARMA has worked hand in hand with the Army, Navy and Air Force—and more recently with the Atomic Energy Commission—in developing important safety-critical systems. ARMA Corporation, Brooklyn, N. Y.; Garden City, N. Y. Subsidiary of American Bosch Corporation.

# ARMA

ADVANCED ELECTRONICS FOR CONTROL



## AERONAUTICAL ENGINEERING

### Where Safety Design Will Pay Off

- Unloading facing of aircraft is safer, more economical and convenient than overwing loading (p. 22).
- Better two-engine characteristics must be designed into pressurized fuselage (p. 22).
- Fuel location must be segregated, so hazard to crash is less (p. 22).
- Aircraft should be designed so that if failure does occur it happens where the engineer wants it to and can control the degree of damage (p. 22).
- Inspection for incipient fatigue failure must be practicable; replacement of faulty elements must be reasonably easy (p. 21).
- Nuts, bolts, cotter pins, and other stress-carrying conditions must be avoided in elements subjected to fatigue loading (p. 22).
- "Fail-safe" items must be truly fail-safe: no upside-down bolts that fall out if the nut comes off, etc. (p. 24).
- Cockpit must be an efficient office, with controls that are easy to operate and indicators that are easy to read and identify (p. 30).
- Location and types of fire detector units and extinguishers must be studied (p. 32).
- Which way should seats face, and what types of seats shall be used? More study is needed (p. 32).
- Look out for difficult operation, or even freezing, of controls which may result from inadequate clearance and loading of liquids onto control elements at low temperatures (p. 32).
- Better provisions for drinking and sanitation must be built into headspace transports (p. 32).

### Littlewood Analyzes Transport Trends—II

## Increased Stress on Safe Design Urged

- Failures cannot always be prevented, so engineers should try to minimize their effects in advance.
- Do this by designing 'intended failure points' to limit location, extent of damage, Littlewood says.

(Last week's excerpt from William Littlewood's Wright Brothers Lecture presented the generally disheartening view of the various factors that influence transport design and specifications. In this second and concluding part, *Airport Week* presents Littlewood's views on the major problems still facing designers, notably in the fields of safety and jet transport development.)

If our transport of tomorrow is to be larger than present aircraft, it will also accommodate more passengers. So for safety, as well as convenience, careful consideration must be given to the number, size and location of every-out door, as well as to the recombination of passengers in the ground.

It is amazing that throughout the years, when passengers have endured the expense and inconvenience of waiting through all kinds of weather between the passenger ramp and the airplane cabin.

• Ground-Handling Problems—It now seems that as our airplanes become

larger and more difficult to handle and as our passengers continually increase in total number and group size, we should pay careful thought to . . . streamlining the airplane at a convenient ground maneuvering and servicing location, and covering the passengers and their baggage and cargo in the airplane by suitable ground vehicles.

Mr. Delano of Delano and Alford, New York architects, proposed the development of a suitable vehicle for handling passengers between a simplified terminal building and the stream-lined airplane. The project was abandoned at that time without, I believe, proper consideration of its imaginative possibilities and the hazards which prompted the thought have become emphasized.

The airplanes are larger and will become increasingly so; the passenger loads have greatly increased; the terminal buildings have grown in size and convenience, and airports have increased in length. Required capital investments and costs have multiplied beyond all reason. The solution now

### Littlewood's Talk

William Littlewood, vice president engineering of American Airlines, was selected to deliver the 11th Annual Wright Brothers Lecture in Washington as a result of his intimate connection with the development of the modern American transport aircraft. He is closely linked with the Douglas DC-3 and DC-6 and the C-47 and the C-54.

Littlewood's lecture, outlining transport trends and setting out guidelines for the future, has earned considerable industry interest and is also being presented before various groups in this country by Chris C. Kuchler, American operational engineering, American Airlines.

In view of the lecturer's importance to industry, *Airport Week* has earlier plans to publish extensive excerpts from it in two parts—the first appeared last week, starting on p. 24. The concluding section starts on this page.

appear to be a reversal of the earlier optimism and the development of a proper vehicle to provide weather protection and convenience from the ramp to within the airplane and vice versa. . . .

• Ramp Problems—We may also hope for design features within our airplane



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Development of Aircraft Pneumatic Systems

critical structure. Experience in the fatigue field has certainly emphasized the value of multiple and redundant structures to protect against the cumulative effects of fatigue.

► **Detail Design**—Another category of design deficiencies which has been too common in transport aircraft concerns the adequacy of mechanical design details, such as bearings, gears, links, pins, and laced and splined assemblies, which were not adequately designed to withstand reasonable wear without early failure or becoming non-functional.

Any design detail, the failure of which prevents the system functioning or causes it to malfunction, cannot be tolerated in a critically important system. An engine is such a complex combination of aerodynamic, structural, mechanical, electrical, hydraulic and materials engineering, etc., that the one all product frequently suffers from deficiencies in one of the categories and not in fundamental aerodynamics.

There have been too many instances in transport design of details which were not "fail safe"—springs down bolts which fell out of place or arrived here there when a nut accidentally came off, hinges which were located on the wrong side of operable inspection doors or loading edge covers, chain attachment fittings which pulled out of their sockets with a minor distortion of the chain structure.

► **Safety Locks**—Whenever possible, sensibly seats, which for safety must not come apart, should be made with built-in safety locks and a minimum of loose parts which can be created in servicing.

Good interchangeability should be provided throughout the airplane for all replaceable units to simplify maintenance operations and to guarantee satisfactory functioning or replacement. A minimum of simple tools should be required for the performance of all frequently required maintenance operations and replacements.

One detail frequently disregarded is the necessity of early recognizable safety wear to be used in service to differentiate between those things needed to prevent accidental use and those intended to prevent bombing loss.

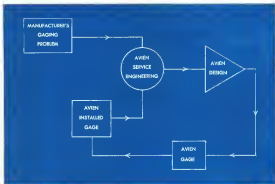
In the one case, you require a high degree of permanence, and in the other, you desire only a temporary restraint.

The use of too-strong safety wear for an emergency squaring handle could easily prevent its functioning when opened.

It has been said:

► **Simplification**—I would also urge all design engineers, and so fact all aircraft manufacturers, to be on the alert for the interest of simplification. It is axiomatic that there are many more people who want to add things to air planes than to take them off.

Starting with the present and based



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But there's another servo principle that Avion offers to every aircraft manufacturer.

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**AIR ASSOCIATES**

of direction and proceeding on down through the sales and public relations department, the operations department, the pilots, passenger and cargo service divisions, the maintenance department, and the engine engineering department. No one apparently is inclined to taking things off. The ultimate effects on weight, economy and safety are evident.

I would like to emphasize the other item with respect to direction. A DC-63 airplane has among its electronic equipment two HF radio transmitter-receivers, one VHF transmitter-receiver and one automatic DF, one glide slope receiver, one radio altimeter, one autopilot, one radar beacon receiver, two communications receivers, one intercommunications system.

Other aircraft of the same type may have in addition a laser receiver, electronic propeller controls for governing and synchronizing, electrical supercharger controls for pressurization superchargers for engine boost, and if we look to the future, we will probably have electrically operated fuel injection, more complex engine-propeller controls and radar equipment, etc.

**Airline Caspability.**—A DC-63 is now equipped with at least 150 vacuum tubes. The average life of a vacuum tube in service is estimated to be 5,000 hours. So, you can see the extreme reliability in electrical trouble and reports of sudden and false transport airplanes.

We do have now in development and available to a limited degree, transistors and associated units which are expected to increase reliability. In many cases—currently estimated at 15 times and ultimately 100 times. They will save weight and space and promote economy. It is hoped they will greatly reduce the cooling problems of high-power electronic equipment.

The progress of miniaturization in class development of transistors, capacitors, resistors and diodes. It will require a long time to find its way into practical benefits of weight and space saving in the aircraft.

The work must be developed to be satisfactory functional types after which they must be applied to commercial electronic work and therefore installed in the aircraft with significant changes of location and installation.

Miniaturization also involves the application of solid-state principles to instrumentation and other functional work where size and weight can be reduced without affecting efficiency or reliability. This whole program is a highly basic

### Hartman

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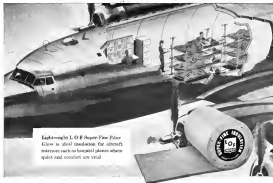
Thousands of opening cycles at rated capacity under conditions of wide ambient temperatures, humidity, dust, altitude, vibration, acceleration, shock. Add to this the possibility of 38-watt generators producing up to 175 volts if a failure applies (all field at high rpm as on island). These rugged conditions demand the utmost in interrupting capacity.

That's why leading airlines use Hartman high interrupting capacity switches in their Convair 440 and Douglas DC-6B and DC-7 aircraft. For the new Hartman remote control circuit and circuit breakers have an interrupting capacity greatly in excess of all requirements from one level to 30,000 feet.

Dependability and safety of these units is repeat of many other Hartman circuit control devices. So if you have an AC or DC control problem, turn it over to Hartman for speedy solution.



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tion. And in addition, Libbey-Owens-Ford's long experience in glassmaking assures you of top-quality Fiber-Glass that meets all applicable Government and commercial standards. If you are looking for superior insulation with a low space and weight factor, investigate L.O.F. Super-Fine Fiber Glass. Contact the nearest L.O.F. office (offices located in 36 major cities) or write Libbey Owens Ford, Dept. F G 3033, Wayne Building, Toledo 3, Ohio.

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# FIBER GLASS

load one loaded in the right direction. . .

► **New Antennas**—In the past we have tried to develop ones, clean, aerodynamic, efficient transport airplanes, and have nearly ended up by piling them all over with antennas, radars and gadgets until we had paid a very significant penalty in performance.

Dr. Harold Schatz of the Glenn L. Martin Co. recently mentioned some future developments in the antenna field:

- All fully-mounted antennas.
- Novel reduction devices such as air ingested radars and electronic aids.
- The use of induction sensors, of special sorts such as jet engines.
- The use of conductive fluids in plastic casings.
- The use of sealed exhaust gases as insulators.

Happily we will have no external protrusions on our future aircraft except those required for the basic aerodynamic or thrust producing properties of the vehicle. . .

► **Approach Considerations**—It seems obvious that the faster airplanes and higher rates of descent to be employed in the future will allow the pilot less time to trim and adjust his airplane for touchdown.

He must start to prepare for his landing further back than is currently the case, and the operation would seem to require a relatively long, straight-in approach. . .

We must visualize a long period of time during which aircraft of conventional types will commingle with an increasing number of high-speed transports in traffic patterns and airport use. These problems directly affect airport utilization and traffic control techniques, both as to efficiency and safety.

It is also apparent that the work may continue to promote the precision of day and night landing and visibility reporting must be carried forward to provide adequate information during that most critical segment of all weather air transport operation.

We are far from a genuine or perception of full instrument landings, and must recognize the existing inadequacies of the transition period from instrument approach to final visual contact. . .

► **Mess on Safety**—I would like to stress a few other safety problems associated with the turbo-prop airplane.

One, of course, is the possibility of mechanical failure, particularly serious with turbine wheels. . . This problem can be approached from the material and design angle providing adequate strength, increased by cooling, and satisfactory inspection methods, to largely insure against failure.

Another approach is to select fuel failures may occur from time to time



**20,200 Hours**  
of accident-free helicopter  
air mail flying with



An extraordinary record of dependable operation has been achieved by Helicopter Air Service, Inc. of Chicago, which carries air mail between Chicago and 36 suburbs. Between August 20, 1948, and December 31, 1950, H.A.S. completed 20,200 hours of accident-free flights with an Franklin-powered Bell helicopter. It has flown 1,845,680 miles, carried 9.5 million pounds of mail, with a performance factor of 98.7%, without a single engine failure.

On one day alone, December 19, 1952, H.A.S. completed 72 shuttle trips, carrying 22,670 lbs. of mail between the Chicago Post Office roof and Midway Airport, plus 16 suburban trips with 5,771 lbs. of mail.

While these records have probably never been duplicated in the history of helicopter flying, thousands of other military and civilian Bell, Sikorsky and Miller helicopters are proving in daily service throughout the world that Power by Franklin means dependable, trouble-free, economical service.

The great majority of all helicopters  
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and to protect against their potentially serious results by powerplant strapping, wheel and landing, or by protective shielding.

Another serious test-to safety problem is that which involves structural isolation and the avoidance of excessive internal hot spots in the event of a crash landing. Possible rupture of fuel tanks or lines, even with-in perhaps, particularly with low-velocity landings, demands very adequate fire protection and possibly rapid cooling methods.

We may also have problems associated with the ultimate limits of construction and with re-lighting in case of jet extinguishment . . . There is the susceptibility of jet-type engines to serious internal damage from intake air turbulence and from the ingestion of foreign objects.

It is also essential that the acceleration of jet engines in case of required go-around on landing be made rapid and dependable . . . without making surge and without having to achieve a too high percentage of rpm and thrust on approach, with its aggravation of the leading deceleration problem.

**Vibration Fatigue**—A safety problem associated with noise, as more particularly with the possibility of structural vibration associated with jet exhaust, is the increasing frequency of structural failures due to fatigue from that cause.

The same most commonly affected are those directly subjected to the jet flow impingement, however, there has been an increasing realization of other critical failures attributable to high-frequency vibrations originating from the jet characteristics. It is to be hoped that the structural advances will decrease or eliminate the noise and structural failures, and will promote thrust efficiency.

**Cockpit Engineering**—I cannot adequately emphasize the importance of better cockpit engineering.

The cockpit must become the center of control, efficient functioning. To that end, it must be adequately roomy and comfortable, well lighted, well heated, well ventilated, provided with fully adequate vision, must have a noise level but adequate number of easily operable controls, and readily identifiable and readable instruments. The cockpit must be an efficient office . . .

**Pilot Warning**—We must emphasize some rather obvious needs in the improvement of jet transport fire protection.

Many personnel have been killed by the fires started for that purpose.

In almost 50% of the cases with which I am familiar, attention was called to the existence of danger by passengers, cabin or cockpit crew, or engine malfunctioning, rather than by operation of the fire warning signal itself. This has been due to improper location of detectors, delicate instru-



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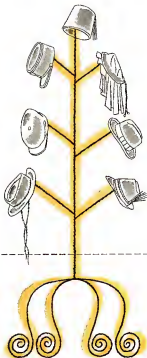
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accuracy of torque measurement cannot be passed to the patient. 50% overpressure accountability with corresponding accuracy. Full temperature accountability, wind, of course, assumes under all temperature conditions the full measure for steel conditions stated in the Code for Regulations, including the correct 5040, ultimate element.

At the other end of the list, no temperature accountability would necessarily result in the loss of the same 50% margin at a temperature of approximately 55F. Fifty percent accountability versus a percentage of the total range of the way to 170F. This is believed to be a very satisfactory and accurate compromise, and its retention in principle is recommended for future operations.

► **Jet Fuel Consumption**—Another important jet efficiency problem is that associated with specific fuel consumption. It appears now that we can hope . . . for fuel consumption . . . approximately twice those to be anticipated with supposed turbo-propeller engines, or with the latest reciprocating compound engines. We are far from achieving such jet consumption values at the present time.

These figures are not directly comparable, but are indicative of a real jet engine jet range and economy problem. Consumption rates are related to intake losses and gas recovery, compressor ratio and efficiency, combustion efficiency, turbine inlet temperature and efficiency, mechanical efficiency, and jet outlet efficiency, compression and combustion.

We are well faced with the true problem in the past in reconciling the installed results with their determined in test stand operation.

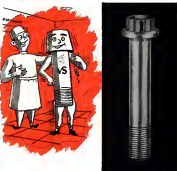
We also look forward hopefully to substantial reductions in indicated horsepower fuel costs and to great improvements in engine overhaul periods and structural costs.

► **Traffic Problems**—These are efficiency problems associated with the introduction of backward transports into the current aircraft air traffic and ground handling problems . . . The jet does not have the facilities of air to ground handling that is now available with conventional aircraft or that will be common to the turbojet type.

We must also exercise caution the significance and value of the so-called "cutting of jet horsepower" that is the determination of proper calculated transient operating values in comparison with the approved ratings figures.

Such devices are severely compromised by decreased thrust available and increased specific horsepower weights. The degree of compromise necessary and desirable is yet to be determined.

► **Powerplant Control**—We must also



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Operating control flaps, trim tabs, air vent flaps, auto gear up-lift, passenger door—helping regulate and control the flow of air to engines, radars, and cargo—performing many other essential and varied tasks, Lea's strong mechanical components and systems are making essential contributions to the vital service rendered by the C-119.

In the field of electro-mechanical operation and controls, twenty-one years of engineering development, design, and precision manufacturing have earned for Lea a position of recognized leadership in flight control.

LEA'S LINEAR ACTUATOR Series 4074 provides powered, installed in military and commercial aircraft, is typical of the Lea electro-mechanical products designed to meet the exacting requirements of the C-119.

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ROTARY ACTUATOR



POWER UNIT



ELECTRIC MOTOR



SCREW JACKS

determine and maintain the effects of wind shape and adjustment, and techniques of pilot/cockpit operation affecting cruising efficiency.

We are faced with a serious problem in the relatively high fuel consumption by taxing operations. And here we must stress airport problems. Ground control must be given to possible damage to runway and run-up areas due to hard, fast and fast takeoffs. These effects are influenced by the character and materials of pavement construction, and by the proximity and direction of the jet exhaust relative to the ground. Augmented factors would greatly aggravate these problems.

Trim strips and holding area must be designed to permit high taxing speeds to conserve fuel, and to increase taxing distances. Areas and runway leading areas must give protection against blast and heat to structures, equipment and personnel, and must adequately control electrical field lines.

Field Considerations—We must be aware very closely the nature and costs of fuel to be used in commercial operations. Current jet fuel specifications are based largely on maximum availability with satisfactory characteristics, which may or may not produce the same answer as a satisfactory fuel of maximum cost.

Turbo engines can be developed to specific efficiencies and efficiency on a wide variety of fuels. Fuel costs are such a large percentage of jet operations that this economic factor must not be neglected.

An important consideration in realistic economic analysis is the adequacy of assumptions of operational fuel reserves. A tentative suggestion which has been discussed with some of the engine and powerplant manufacturers is to assume a 45 min. weather hold at 20,000 ft. at destination, followed by a descent to augmented landing, then a climbout to 20,000 ft., and a cruise to descent at 400 mph, followed by an additional hold of 45 min. and descent to landing.

This would appear to be a fairly drastic reserve requirement, but is not unreasonable with operational requirements under extremely adverse weather conditions.

It appears that with turbofan engines of modern design, there is relatively little difference in the fuel consumption rates of four and two-engine holding, and quite differently from Current Coast experience—no particular penalty to pay.

Natural Conditions—It is to be hoped that much may be done satisfactorily outside for determining the existence of lateral conditions which are signs of progressive deterioration.

It would be of immense benefit to

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jet accessories if methods can be determined for detecting and forecasting serious mechanical troubles, serving also perhaps as a most logical basis for over haul.

Much additional information must be obtained to establish the most efficient jet operating altitudes. It seems a reasonable conclusion that the possible altitude range of efficient jet transport operations will be between 30,000 and 55,000 ft.

Once 50,000-ft. operating altitude is established—and indeed it is most for jet operations—the problems are largely ones of degree and not of nature. We must have absolute assurance of no de-

compression follows.

► **Flight Miles Up**—Until recently much thought was given to anticipated commercial jet operations to approximately 40,000 ft., but more recent information has indicated that this may be a somewhat unfeasible altitude, with prevalent turbulence and high wind conditions.

It would appear, therefore, that jet transport operations may often be conducted at altitudes somewhat in excess of this, and that for the selection of a reasonable bracket of efficiency factors, they should not frequently be too much lower, although 30,000 ft. may often prove satisfactory and desirable.

It has also become increasingly apparent that at the higher altitudes jet stream velocities must be reckoned with, and revealed if they are in an unfavorable direction, and that the boundaries of such jet streams must be traversed in the shortest time to minimize the undesirable turbulence.

► **Fast to Return**—We have tried to show that since the discarded air transport equipment of 25 years ago, there emerged a simple and consistent type generally suitable to the air transportation services of this country and of the world, and serving generally in terms, capacities, arrangements and performances.

We are now at, or by British standards, just over the threshold of a revolutionary change in air transport propulsion. There are some significant changes indicated in the engines, themselves, involving refinements of aerodynamic streamlines and form, and substantial extensions in speed, altitude and maneuver performance, equip capacity and requirements.

For many applications of the modern turbo-jet—certainly the local or short range operating field—desirable changes in existing characteristics do not appear to be necessary or desirable. There will, in any event, be a protracted transition period during which the very substantial changeover will be effected.

We must never forget that effective speed is of the essence of air travel, and in spite of possible economic problems and technical difficulties, the feasibility of that speed with adequate safety, dependability and comfort will find extensive use in the extended services of this country and of the world.

► **British Lead**—It must be freely admitted that as of today, the British have a substantial lead on us in the accomplishment of a limited area of high-speed transportation. Thus, I believe, is due largely to the existence of an integrated and implemented program of British aviation experience, both air and land.

In 1918, Lord Northcliffe, then Chairman of the British Civil Air Transport Committee, stated, "Cost what it may, this country must lead the world in civil aerial transport." For a number of years, the British led down that path.

However, starting in 1937, and for 20 years thereafter, American enterprise acquired and retained the leadership in both quantity and quality of air transport.

The stiffened and implemented British policy of the days immediately following the second World War, however, certainly demands to transfer that leadership in quality of performance, if not in quantity.

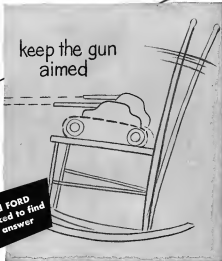
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## TO KEEP GUNS STABILIZED over rough terrain



keep the gun aimed

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Over-type area a tool guides and houses like a rocking chair—but regardless of the bumps, ditches, hills—the gun keeps pointing at the target while the tank is moving. Ford Instrument Company played a vital role in designing and manufacturing a stabilizer seat for the tank's gun line control system.

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From the front line in Korea last year came calls for a 10-man helicopter. The Air Force had some but they were in Florida—9,000 miles away.

Normal air transport could make the flight in time, but tearing down a helicopter—re-assembling it in Korea—would waste a week. So the Air Force turned to a Douglas C-124 Globemaster, the flying giant that carries thousands of men, ton upon ton with a 25-ton payload. Globemaster opened its clamshell doors

and swallowed the helicopter whole, took off, and reached Japan in 72 hours. Next day, at the Korean front, our men had the helicopter they needed.

Performance of the Globemaster in action is another example of Douglas leadership in aviation. Faster and bigger with a greater payload is a basic concept of all Douglas designs.



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ENGINE SERVICE

For easy access  
to engines, C-124's clamshell  
doors "swing out"—allowing  
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ENLIST TO FLY  
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First in Aviation

knowledge and capacity at our command, we could easily re-establish our pre-eminence in air transportation.

However, I am bold to state that before that is accomplished, there must be more evidence of innovation at the pioneering spirit which has always characterized American industry, and which has now apparently deserted the plans and strategies of the American air transport operating and manufacturing groups.

We do not want in America the government domination of the air transport manufacturing or operating industries which prevails in Great Britain, but we do want some semblance of the results that have been obtained by that system.

There must, I believe, be a basic change in the attitude of our aircraft manufacturing industry toward the desirability and possibilities of producing lighted transport.

I do not hesitate to include in this the powerplant manufacturers and the necessary and equipment producers, whose products are essential to the system.

Lacking a controlling national program in this field—and we would not wish to have any such—we must rely on the courageous leadership of private enterprise to stimulate action.

**Good Action Needed.**—I would say that there is little likelihood of selling high speed transports in the design and development of which prospective customers have had no voice. We have seen today that the government is aglets with such projects.

Nor is there much likelihood of selling units, after powerplant or airframe, which threaten to cost nothing like the amounts which have been recently quoted in the American press. The figures put do not smack of reality, nor of any real desire to do the job, nor indicate any willingness to take a sizeable American industrial risk in the doing of it.

I would like to think when we would be today if that spirit had characterized the 27 years of air transport which have just passed. It is clear that unless there is a substantial change in our attitudes and accordingly means, the manufacture of lighted air transports will depart from their American shores just as did the merchant marine of the past. It can happen again.

No final endorsement, then, is to be appraised the statistics boards contain the rules we are about to take, and the rules we cannot afford not to take. We of the air transport industry admit our consequent responsibility, and would be happy to join with the designers and manufacturers in bringing about the early availability of the world's best high performance transport airplanes.

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And Silastic is in a class by itself among rubbery materials. For example, we have aged typical samples of a Silastic stock for 12 months in an air circulating oven at 350°F. After such accelerated aging, these samples showed an increase in hardness of only 10 points from

46 to 64 durometers, elongation went down from 320 to 100%, tensile strength dropped only 36 points from 557 to 521 p.s.i., and there were no significant changes in any of their dielectric properties.

And that is almost incredible performance at temperatures high enough to change any other kind of rubber to a brittle, noninsulating material in a few hours or days at the most. When you need rubbery properties or good dielectric properties in a resilient material that will withstand weathering or long exposure to temperatures above or below the limits of ordinary rubbers, specify Silastic.

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## IAS Summaries

Papers in rocket propulsion and aerodynamics presented at the 32nd annual meeting of the Institute of the Aeronautics and Astronautics are summarized on the following pages.

The summaries continue a week before two weeks ago on the IAS meeting. Others will be posted on an early basis.

### Rocket Propulsion

Just Begins in cooperation with  
the American Rocket Society

►The Effect of Shell Properties on the Burn Formed by Two Impinging Jets. M. F. Hordeman and S. J. From, Lewis Flight Propulsion Lab., NACA.

This discussion shows the effect of shell properties on the spray formed by two impinging jets. Tests used in this investigation were placed water nozzles and hydrocarbon oils.

It was found that the length of the spray before leaving into droplets was dependent on shell properties but that the maximum width of the spray was controlled by the fluid properties. The most significant effect of the fluid was found to be on the character or structure of the spray.

►Measurements in Rocket Engine Testing. Howard B. Jerns, Jr., Reaction Motors, Inc.

This paper covers the application of conventional instrumentation in the operational field of rocket-engine testing with special emphasis on the less conventional techniques, and quick analysis of data obtained therefrom. Some devices described are a multi-channel pressure recording unit operating into a single cathode-ray oscillograph and tape recorder, and use of a conventional wave analyzer with automatic response.

►Early Warning Techniques for Orbital Rocket Vehicles. Karl S. Verling, Rocket Research Engineers, Bell Aircraft Corp.

A desirable function of a satellite or other high-altitude rocket vehicle is that of intelligence—i.e., the gathering and transmission of information about the earth's surface.

Two possible methods of viewing the surface are described, assuming the restricted payload and space of a communications satellite vehicle: an optical image-converter system and microwave radar. An altitude of 500 mi., orbital velocity of 1 mi. per sec., and hypothetical height of 600 mi. diameter are assumed.

It is shown that the net viewing power of this optical-radar system is limited by the image converter and available bandwidth can handle the effects of atmospheric, meteorological conditions, and other factors on this demand.

The approximate viewing power, weight, and power and space requirements of a radar unit are outlined.

It is believed that, with the present state of radar technology, the optical system has the weight and viewing power advantage, but

AVIATION WEEK, February 14, 1951

# Know How

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to daylight discrepancies and atmospheric fluctuations are severe enough to indicate questionable results. Furthermore, the few existing points of a solid wall from the 100-mg. effects and atmospheric losses limit the usefulness of the system.

It is generally concluded that the discussed measuring technique for the location of the selected target may not be practical in a real experimental orbital vehicle. The advantages of a beam scanner for most of the experiments are not slight in a weight saving.

### Aerodynamics

► **Validation to Supersonic Flow:** Leslie S. G. Kinsler, Assoc. Prof., Dept. of Aeronautics, The Johns Hopkins University.

There is a rather fundamental conceptual problem for turbulence in a compressible flow. The number of physical quantities that describe it grows faster than in an incompressible flow, since not only viscosity and pressure but also density and temperature may fluctuate.

With appropriate pruning of the fluctuating, one can define three distinct "models" for compressible turbulence, including velocity fluctuations (anisotropic), and mean stress (anisotropic).

The best way to measure anisotropy is to use three models, although in a different manner to each one. By operating the but very different measurements, a "turbulence degree" can be obtained and the different models of fluctuations distinguished. Comparison cases can also be interpreted by the fluctuation degree.

Measurements in the free stream of a supersonic turbulent and in a supersonic turbulent boundary layer were carried out and detailed fluctuation diagrams obtained. The interpretation of the results indicated that all three "models" are significant in the actual flow field.

► **Review of Published Data on the Effect of Roughness on Transition from Laminar to Turbulent Flow:** Hugh L. Dryden, Director, NACA.

A review is presented of the published data on the effect of roughness on transition from laminar to turbulent flow, in which an attempt is made to summarize and correlate the available information.

The reviewer directs that transition Reynolds number of a flat plate with zero pressure gradient is a function of the ratio of the height of the roughness element to the displacement thickness of the boundary layer at the element, the functional relationship being a useful representation of the data, thus a constant critical Reynolds Number of the roughness element. Other data show that the effects of roughness are similar in streams of different mass transfer rates and that a plot gives good correlation of all the data for a given shape of roughness element when transition occurs downstream from the roughness element. As a roughness element of the height  $h$  is placed in the stream, the transition Reynolds number is increased, the transition position upstream the element and moves downstream as the height  $h$  is increased. The paper also discusses available data on the effect of distributed roughness on



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of certain of the newest and largest British and U.S. turbo-jet engines. Esso turbine oils have superior low temperature characteristics and at the same time show remarkable load-carrying ability at operating temperatures.

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# Here's Why Leading

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## 144 Frequency H. F. Communications Equipment

Flexibility, dependability, and power are important reasons why Aerocom's AT-144 and AR-144 are selected by the world's foremost international air carriers.

**Flexibility**—with separate transmitter and receiver, cruise land operation is possible. Reception is possible without placing transmitter in operation thus avoiding reduction in unswitched frequencies such as channels for weather broadcasts and time signals.

**Dependability**—the major component parts of this equipment have been proven in years of actual service. Simplicity of design has minimized the number of tubes required, all of which are operated conservatively.

**Power**—here is a new 100-watt high frequency airborne transmitter with unusually high average modulation level (by

employing an adjustable peak clipper—60db). This transmitter with related power supply and

automatic tuner is designed to meet ARINC characteristics Nos. 522, 523, and 525. It is the **practical answer** to the need for modern high frequency communication equipment.

All units operate safely on a 28-volt DC supply (400-cycle power is not required). Under emergency conditions, this means minimum drain on power sources.

Installation and removal for servicing can be done easily by one man, so each of the four component units is no larger than one ATR case; the weight of incident unit is less than 45 lbs.

The Model AR-144 receiver (C.A.T.C. 293-3) has been in actual use for more than a year, while the 72 frequency model of this receiver has been in service better than two years—a total of more than 600 units in actual use!

Aerocom's high frequency equipment has already been engineered for installation. It has been service-tested in international air carrier operations. Learn you how effectively it can meet your communication requirements!

**Transmitter Model AT-144** Manufactured to comply to ARINC characteristics No. 522. Frequency range 1.6 to 3.0 Mc. Power output 100 watts. Operates on 28 volt DC. Carrier power output 300 watts at 45 db. Without removing transceiver from rack, frequency plus can be altered by changing the crystals only. Weight 45 lbs.



**Receiver Model AR-144** Frequency range 1.1 to 3.0 Mc. receiving 144 crystals controlled. Frequency in 20 bands. 7 tubes. Weight 32.5 lbs.



These Aerocom engineering models were flown under service conditions during May and June, 1952, in a Pan American Trans Atlantic Direct Circuit.

**Automatic Airborne Search Model AR-144** ARINC characteristics No. 525. Designed to give maximum tuning time and maximum efficiency with grounded-type antenna employed on 4-stage circuit. Frequency range 3.6 to 7.5 and 20.225 Mc. Operates on 28-volt DC. Weight 19 lbs.



**Power Unit Model D.P.M.** Manufactured according to ARINC characteristics No. 523. Uses a well proven, constantly used dynamotor type. Operates on 28-volt DC. Weight 34 lbs.



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**WIRE CONSTRUCTION**—Figure A, lead wire is specified in AWG 18. Available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

**COPPER CONSTRUCTION**—Figure B, lead wire is specified in AWG 18. Available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

**IRIDIUM-ALUMINUM**—Figure C, lead wire is specified in AWG 18. Available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

Write for data on any of above or wire to new AWG specifications.

#### ACCESSORIES FOR THERMOCOPES



**Download by Terminals**—The AN1114-1 terminal block is used in aircraft. It is available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

**Aviation Series**—The AN1114-1 terminal block is used in aircraft. It is available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

**Thermocouple Leads**—The AN1114-1 terminal block is used in aircraft. It is available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

#### TERMINALS FOR THERMOCOPES

In connection with AN1114-1 terminal block is used in aircraft. It is available in sizes E to 18 class A or B. Thermocouple wire available in AWG size from 18 to 20 to the 100 AWG.

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investigated. An illustrative example of the gap effect on wing tip interference is also presented. The various effects, which are important for very small gaps, are discussed qualitatively.

► **Tantric Flow Past Simple Bodies**—J. D. Cole, G. E. Solomon, and W. W. Williams, California Institute of Technology. Tantric flow past curved plates, a lifting surface, and a lifting flat plate is investigated theoretically and experimentally. The existence of a closed smoothly solvable case embedded in a supersonic flow field is demonstrated experimentally for tantric flow past curved plates. The case described represents simple, two-dimensional cases for which the flow pattern from infinite through some to represent flow can be obtained with infinite ease. The understanding of these cases is extremely useful for handling the general tantric flow problem.

► **Supersonic Flow About Slender Bodies of Elliptic Cross Section**—A. Kikuchi, Principal Aerodynamic Development, The Reynolds Engineering Corp., and A. J. Kikuchi, Science Faculty, Chiba University, Japan. A theory is presented for slender bodies of elliptic cross section in supersonic flow.



ARA TRANSMIC WINDTUNNEL is expected to be in operation by mid-1968.

## U. K. Industry Team Builds Tunnel

Construction of Britain's new high speed tunnel—presented in a competitive venture by 14 of that country's aircraft firms—is scheduled to begin early this year.

Since starting work on the project about one year ago, detailed plans have been drawn and are now being completed. Expected cost is around \$4 million, and the completion date is estimated as somewhere in mid-1975.

► **Faceted Turbines**—The major purpose of the tunnel is to test aircraft models from first proposal stage to final design. Little basic research work is to be conducted. Detailed planning included two two-week, high speed techniques have advanced the art to the point where the design of Mach numbers up to 1.4 will be covered in one tunnel. A smaller tunnel will be added later for speeds up to Mach 1.0.

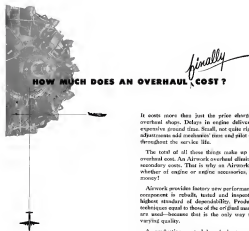
Location will probably be near the National Aerodynamic Establishment's new site at Bedford, where the Govern-

ment is applying to the air and light-speed pressure distribution on elliptic cross section aerodynamic bodies of elliptic cross section. Results of several simple experiments are presented.

Comparison is made with the nonlinear elliptic cross calculations and experimental results of flow, good agreement is obtained. The most difficult bodies with elliptic cross is also treated. Application of the theory to bodies at angle of attack is also noted.

► **Experimental Investigation of the Characteristics of the Supersonic Airflow and Vortex Shedding**—J. D. Cole, G. E. Solomon, and W. W. Williams, California Institute of Technology. The characteristics of the supersonic airflow and vortex shedding are investigated. The results of the investigation are presented.

Measurements by the transonic flow method in a supersonic flow at Mach 2.1 are presented. Corresponding measurements in the transonic flow region on a flat plate are presented for comparison. Total pressure gradient, velocity profile, and skin friction coefficients are obtained from a Reynolds Number range from  $0.2 \times 10^6$  to  $2.2 \times 10^6$ .



## HOW MUCH DOES AN OVERHAUL COST?

It costs more than just the price charged by the overhaul shop. Delays in engine delivery pile up expensive ground time. Scuff, not quite right fit and adjustments add mechanics' time and pilot annoyance throughout the service life.

The total of all these things make up your true overhaul cost. An Airwork overhaul eliminates these secondary costs. That is why an Airwork overhaul, whether of engine or engine accessories, saves you money!

Airwork provides history new performance—every component is rebuilt, tested and inspected to the highest standard of dependability. Production line techniques equal to those of the original manufacturer are used—because that is the only way to get unrivaled quality.

A production control board charts actual daily progress of your engine through Airwork. Potential troubles are spotted and eliminated before they can become bottlenecks. That is why you get on-time deliveries of your engines.

The proof of it all lies in the acceptance of Airwork as the prime overhaul base for 6 scheduled airlines—the people who know total overhaul costs best of all.

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## PRODUCTION



FIVE DIFFERENT PROFILES can be ground with the new Polygon Grinder.

### New Tool Grinds Various Shapes Polygon Grinder turns out triangular configuration said to be superior to splines, keyways for driving.

A grinding machine which generates a three-sided profile claimed to be superior to a spline or keyway as a driving member is getting the attention of producers engaged in the aeronautical and other industrial fields.

In addition to the triangular configuration, this grinder will generate elliptical, square, eccentric and cylindrical forms.

A key feature reported for the tool-known as the Polygon Grinder—is that it will grind the inside as well as the outside diameter of the three-sided and shaped configurations. However, the inside diameter of all the non-circular profiles can also be produced by a broach powered in the machine.

• **Boeing.** Indianapolis-Navy Bureau of Aeronautics is said to be interested in the potential production capabilities of the tool. It is reported to be delegating industry tours to witness demonstrations of the tool's accuracy and production speeds, at the S&S Machinery Co., 140-51 St., Brooklyn, N. Y.

One aircraft engine manufacturer already has the machine and is giving it close study aimed at bringing it into the production volume. Another company has the machine in conducting a study on Polygon-produced drives for application in the heavy industrial machine field. An American manufacturer is reported to be using the tool to develop operational and production data.

Analysts of the Polygon machine as the K-Polifit Grinder, developed in Aus-

tria in 1939 by Ernst Krenkel & Co., for connection of a shaft to a hole by means of a triangular profile. About 230 of these machines are said to have been in use between 1940 and 1945. The Germans are reported to have cut field maintenance considerably with such machines using the three-sided drive.

On the basis of experience with the early grinder, the present Polygon machine was developed by a European tool manufacturer in collaboration with Kraus. S&S has the manufacturing and sales rights in the country and Canada. The use of the Polygon's grinding wheel moves in an oscillating path which is synchronized with the uniform rotary motion of the workpiece.

• **Rotation** is produced when the wheel makes one cycle to a single rotation of the work.

• **Triangle** shape is produced by three to one ratio.

• **Square** shape is produced by four-to-one ratio.

The movement of the wheel can be adjusted for cylindrical grinding, so that special profiles and critical tolerances may be produced on the same workpiece with the same centers and set-up. The machine is said to grind inside and outside diameter types in the various size designations.

S&S contends that the Polygon machine will produce drive members inter-

with more precision, and at less cost than a spline arrangement. Accuracy of the Polygon produced male and female members are within .0001 in., and saving of manufacturing time over a spline with equivalent torque capacity is about one third, it is claimed.

Another advantage reported for the three-sided drive is that it has a load-bearing surface of about 90%, against up to approximately 50% for the spline.

Inspection procedures on the Polygon produced drives also are reported to be much simpler than for spline make-up.

## PRODUCTION BRIEFING

► **Willys Aircraft Corp.,** Cincinnati, Tex., has been awarded a major sub-contract by Texaco Aircraft Corp., Dallas, for complete empennage, main wings, ailerons and spoilers for T-33 Buckeye trainers.

► **Grumman Aircraft Co.,** Glendale, Calif., recently delivered a prototype helicopter simulator for Navy classroom instruction of maintenance and operation personnel.

► **Keston Motors, Inc.,** Redwood, N. J., is undertaking a \$5.54 million modernization program to provide new engineering, research, laboratory and administrative facilities. A 60,000-sq-ft machine shop is planned.

► **Macdonald, Inc.,** Ridgeport, Conn., has acquired Plant 3 at Bagdad Municipal Airport for expanding output of aircraft assembly rigs, tools and dies and metal and fabric-covered assemblies.

► **Chance Vought Aircraft Division of United Aircraft Corp.** is constructing a new 516,000-sq-ft structure for building up in Dallas. The new structure building is scheduled for completion April 1—will house machine shops, X-ray rooms, chemical, materials storage and hydraulic laboratories and a control test floor.

► **Electronic Engineering Co.,** of California, Los Angeles, has received a \$175,450 contract from the Navy for installation design work on guided missile instrumentation equipment at Naval Air Missile Test Center, Point Mugu, Calif.

► **Pacific Aerospace Corp.,** Burbank, Calif., has been named distributor for all products manufactured by Timbex, Inc., including scanned and scanned metal lines, precision bellows, synchro transmitters, synchro shafts, electrical connectors, rigid and flexible wave guides, flares and fans.



Steven Christoff, general manager of wood body and fuselage at the aircraft industry division of the Twincraft Corp., is seen here with his family. Among his first steps 12 years in the industry, said of Twincraft with Twin Coach.



## Here's how Twin Coach helps lock Davey Jones' locker

GRUNDIGEN UP ALLATROSS amphibians have established remarkable records in moving crowded seamen from Korean waters, after behind enemy lines.

Twin Coach was selected to build, in quantity, the massive center panel and wings for this important nation rescue craft. In addition to fabrication and assembly, Twin also installs all wiring and tubing, ships complete sections ready for final assembly.

Twin Coach plants, among the best equipped in the nation, are also in volume production on assemblies for helicopters, attack, and search planes. Modern facilities, modern equipment, and experienced manpower make Twin Coach a dependable source for every type of major airplane assembly.

A-100

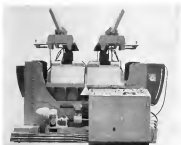


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NEW MACHINE built for Lockheed Aircraft Corp. by Ethelred Machine Works, Inc.



BENDS REAMS of high-strength aluminum alloy for Super Constellation

## Lockheed Bender Goes to Work

A special new machine has been put to work at Lockheed Aircraft Corp. bending high-strength aluminum alloy wing beam sections. Ethelred Machine Works, Inc., built the tool—one of a pair—by Lockheed design specifications. The second unit is at Buell Aircraft, Wichita, where it is used for processing Lockheed parts required in B-54s.

The new tool will bend beam sections having 754 in. and more than 90 ft. long, bending them to angles up to 50 deg. at 125°.

A retinal control can be adapted to that springback will not warp the bent part from the proper plane.

Fast, Two-Function, Lockheed beam bender and other extension by use of Cincinnati or its hand blocks and dies. But the 754-T required hot bending, so Lockheed's manufacturing research branch came up with the idea for the new tool.

Jobs formerly requiring 18 minutes are now done in three minutes. And Lockheed says the greater bend accuracy that is realized.

The tool has self-contained hydraulic power. For processing different shapes, only inexpensive inserts are needed. These adapt themselves to the part construction, and clamps close it set of

pins to grip the part together tightly. Integral heater plates are automatically regulated for temperature. In case springback varies with small time periods, distances there are positions to grip the heat of the part while it is clamped in the machine.

Real Control—During the bending operation, an equalizer gives symmetrical elevation of the pins. There are adjustable centers of rotation for each jaw and automatic, adjustable stops for controlling bend. Jaws can be rotated around the part conforming to preposition (bent) and overbend angles properly and allow for springback in both planes.

Bend angle can be checked quickly during the tool try by opening the clamps and measuring a template. The tool can exert a backward pull to correct a part which is overbent during initial adjustment. It will also remove badly warping structures bent in one clamp or extended parts.

Bending speed is adjustable. All heat flow are push-button-controlled. No general operating skill is required. Lockheed says.

## USAF Contracts

Following is a list of USAF contracts recently announced by Air Material Command.

Contract 307-3100, Inc., P. O. Box 115, Poughkeepsie, N.Y. air transport service \$12,000.

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Contract 307-3100, Inc., P. O. Box 115, Poughkeepsie, N.Y. air transport service \$12,000.

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MODEL "L" CECOSTAMP

When you are required to turn out a small quantity of completely assembled units with all the accuracy and finish of final production, a CECOSTAMP can do the stamping job for you—accurately and economically. CECOSTAMP's versatility and accuracy, plus economical zinc alloy dies, combine to give you both satisfactory work and savings.

## HERE'S AN EXAMPLE OF CECOSTAMP OPERATION

Primary rear shock pads for "Packard" is a new model of one of the popular cars was accomplished with a minimum of time and expense; using zinc alloy dies, on a 30" x 45" CECOSTAMP. The expert line of the CECOSTAMP bends the part precisely and free of springback, making it ideal for the subsequent "mach up" work.

Ceccostamps are air-operated impact drop stamps on which a wide variety of metal shapes can be made. Accuracy of the impact is completely and instantly controlled by the operator. Low maintenance, operating economy, run accuracy and the use of zinc alloy dies are engineered features of Ceccostamps. Write for a copy of Bulletin 30-L-0.

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

**CHAMBERSBURG**  
CECOSTAMP



## Changing the map of the world —with RCA Shoran

A SHIP SANK in these remote seas—because a chart was wrong. But that won't fool navigators any more. Modern aerial survey... using RCA Shoran and photogrammetry together... revealed the true shoreline (the lines in white). Now, the charts are right!

Suspecting any optical survey system now is, in fact, this: "Shoran" can map land-and-sea areas never explored by man—and do it at flying speeds as high as 600 mph. Accuracy is better than 35 feet in 300 miles or more. Here's how it's done.

Two widely separated Shoran stations on the ground (or aboard ships) from the base of a triangle. The plane becomes the apex. Picked radar signals from the Shoran are received by each ground station and retransmitted back to the pilot. On a ruler across the pilot's eye are "m" for north station signal. He calculates the "m" and "n" and gets his fix. Common and with the Shoran equipment, simultaneously photograph the coastline—and the ground along its course. Result: a highly accurate and permanent record of every square foot he covers.

Just another application of RCA Shoran—adapted to fit use in locating oil wells, plotting underwater radio relay and pipeline routes, detecting mine fields, and practicing bombing.



**RADIO CORPORATION of AMERICA**  
ELECTRONIC PRODUCTS DEPARTMENT CAMDEN, N.J.

## AVIONICS

### Lear Damper Steadies F-86D

Sollee gets new 3-lb. unit that shares servo actuator with F-5 autopilot; rate gyro omits gimbal bearings.

By Philip Klaus

Lear, Inc. has announced a new lightweight yaw damper of a new design that prevents " Dutch roll" or "rolling" of North American Aviation's F-86D in steep climb, high speed, high altitude flight.

The F-86D damper does a job that might have required an additional hundred pounds of advance weight if NAA engineers had chosen to provide the needed damping by aerodynamic means.

Designed by the Model 1580D damping control, the Lear device can be used for yaw or pitch yaw damping. On the F-86D, the damper operates in a sort of passive partner to the Lear F-5 autopilot and in the same place.

When the F-5 is in use, the autopilot itself provides the necessary damping, and the separate Lear control is in standby condition. When the autopilot is shut off, the damper automatically takes over without any delay for warm-up.

The two systems are not completely independent. They share a common F-5 autopilot radar servo actuator, among the spare and weight of a separate damper servo.

Behind the Pilot's Back—The autopilot/damper servo is connected into the radar control system in a differential fashion so that the servo-controlled radar action causes no deflection of the pilot's rudder pedals. The result is that the human pilot does not know that the damper is operating unless he looks back at the soldier.

The earliest type of yaw damper was unable to discriminate between a gyro-referenced turn, which it should allow, and an unwanted airplane yawing that the damper should oppose. Lear says its damper prevents the human pilot to turn at will without opposition from the damper.

Lear Approach—Like the General Electric and Minneapolis-Honeywell dampers, the Lear system uses a rate gyro to detect airplane yawing. However, instead of using the yawing velocity signal as generated by the rate gyro, Lear converts the signal into what essentially is an angular acceleration signal. This derived angular acceleration signal is applied to the servo actuator, which in turn moves the rudder

to oppose the airplane's yawing motion. Unlike most dampers and autopilots, the Lear system does not use a follow-up speed proportional to rudder position.

Instead, it relies upon what is called "force feedback," reflecting increased displacement forces on the rudder back into servo motor in rudder deflection as measured.

Resolves the F-5—The new damper boots the same light weight, small size and simplicity in design that characterize the F-5 autopilot. The mechanicals of the damper circuits in those used in the F-5 is no wonder. North American approached Lear for the damper about the time Lear was starting production of its F-5. Its exploring of inertial circuits in the damper, Lear was able to cut engineering design time and to save economies in construction.

In addition, Lear policy calls for employing the F-5 design by "lifting out" components and applying them to other tasks. For example, the F-5 vertical gyro forms the heart of the Lear yawing-sensing horizon used in many current USAF planes (Aviation Week July 14, 1962, p. 35). The F-5 servo is used in the damper and also is used for other actuator applications. This policy enables Lear to build a maximum manufacturing lead time in response efforts.

Naval Rate Gyro—A trained characteristic of rate gyros used in airplane stabilizers is that their output may be linear at unacceptably high airplane oscillation frequencies. This requirement usually is met by driving a rate gyro with a natural frequency of 10-15 cps whose linearity is improved by means of magnetic or viscous damping.

Lear has chosen a mechanically simpler solution in which the gyro is designed to have a very high natural frequency, thereby eliminating the complexity of damping.

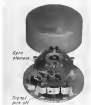
For comparative reasons, Lear is close-mouthed about gyro details except to say its rate gyro design eliminates the need for gimbal bearings required in conventional rate gyros.

The resulting gyro has a 33-cps natural frequency which, without damping, gives a linear gyro signal (no appreciable phase lag) out to oscillation frequencies of 10 cps. The gyro itself

LIGHTWEIGHT Lear damper (5.2 lb.) shown in vertical vibration mount



COMPACT construction of damper is evident when cover is removed.



RATE GYRO uses each of its shafts to eliminate of gimbal bearings.

is mechanically sealed in its own case before mounting in the hermetically sealed damper case.

Damper Operation—The 400-cycle rate gyro signal first enters a detector

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series tube, stage, where it is converted to d.c. The signal then passes through a derivative network, advancing the phase of the signal so that it leads airplane displacement by about 150 degrees. This requires no delay. The network also filters out unwanted high frequency harmonics from the gyro signal.

The signal is amplified in an early amplifier stage and then applied to a dual-triode, which operates push-pull to control the channel having through the servo's two magnetic chokes.

(The P-5 servo consists of a non-rotating housing of a motor that drives two counter-rotating magnetic powder chokes. Entering one choke is the servo's cover; the other output pulley to rotate clockwise or counter-clockwise. The output torque is determined by the magnitude of the chokes' current.)

The tube complement consists of three 12AY7s, which are also used throughout the P-5, and two 6AL5 rectifiers. Tube filaments are powered off and connected in series across the airplane's 27.4-volt power supply to operate at about 85% of rated filament voltage. This is a standard low-power vessel of an igniting tube. As regards to the P-5 and amplifier tube, the design of the power supply is not.

• **Control System Functions**—In some of the latter part, amplifier and amplifier assembly is "open" mode to be used at different operating altitudes and speeds to maintain optimum performance. The damping control on the P-560 uses the gain changes provided by the amplifier.

In an airplane not equipped with the P-5, a separate servo motor and a small gain changer would be needed. Having total design result to about 14 ft. This is about half the weight of the standard stability amplifier used on the Northrop F-80, which performs a much simpler function. (Aviation Week Sept. 4, 1952, p. 46).



## SHOCKPROOF AMPLIFIER

Internal vibration and shock mounts, made by Robinson Aviation, Teleson, N. J., are a new feature of this shockproof gain amplifier recently developed by Robinson Aviation, Inc. Internal vibration isolates and controls the gain and permit it to be mounted in any position.

# Here's How This JOY AXIVANE® Aircraft Fan Solved a Problem of Unmatched Complexity

WHEN the Air Force and Consolidated Vultee, manufacturer of the B-36, decided it was necessary to have a pressurization blower for their long-range bomber, they really threw the design-book away. The requirements for the blower would create any prospect for its supplier to have margins. Specifications called for three aspirator fan-blades:

- A 1100 CFM at 32" W.G., with an air density of 0.046 lbs./cu. ft.
- B 700 CFM at 40" W.G., with an air density of 0.10 lbs./cu. ft.
- C 600 CFM at 20" W.G., with an air density of 0.090 lbs./cu. ft.

Space and weight limitations were stringent. The fan had to operate without excessive horsepower requirements due to a critical load on the generators. In addition, the fan motor had to be protected from box air in the duct system.

Just about when the job seemed impossible, it was solved once by Joy engineers. . . and not only was the problem solved in the complete satisfaction of both the Air Force and the manufacturer, but the prototype fan was in their hands only five months after Joy received the order.



The fan exactly meets the three design specifications: 1100 is diameter and 17" is length. Because of its combination of magnesium and aluminum construction, the fan weighs only 54 lbs. It is a two-stage unit, driven by a two-speed, 400-cycle motor. The efficiency of vaneless fan design permits using a motor rated at only 12.6 H.P. continuous duty. The stationary vanes which support the motor are hollow, so that cooling air can be continuously directed over the motor. Each stage of the fan has a set of staggered vanes. Casing and hollow vanes are a single casting for shock-resistant strength.

• We freely admit that this is one of the toughest fan design problems Joy engineers have ever tackled. On the other hand we are just as sure that, in the future, even harder problems will be taken on and solved. Even if your stretch fan problem is not a difficult one, it is a good bet that the incomparable vaneless-fan design know-how which produced this AXIVANE fan will give you the most for your money. If you need an stretch fan for any purpose, call on JOY—the world's largest manufacturer of vaneless fans.

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Consult a  
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## JOY MANUFACTURING COMPANY

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Most everybody knows that Kingflow is the place to come with problems of cleaning, bracing, welding and assembly. Our shop is scientific, our often patented processes produce results on each job. The concept of engineering help we can offer will surprise you. Our Kingflow Mfg. Co., 3000 Foster Ave., Cleveland, Ohio.



**KONIGSLOW**

► **USAF Eyes Higher Frequency Power**—Air Force is studying acoustic value to determine interest in shifting from 400-cycle ac power to a higher-frequency source, possibly 7,000 or even 1,000 cycles. Survey results to date show considerably more industry interest in shift to high frequency than did previous survey of several years ago. One possible reason is growing use of magnetic amplifiers. As supply for capacity goes up, magnetic amplifier

response goes up, and size and weight go down.

- **Aviation Industry Expansion**—Sixty-six manufacturers expansion by aviation manufacturers include:
  - **General Motors, Inc.**, newly formed subsidiary of Bendit Engineering Corp., will handle production phase of Bendit's main contracts, specializing in electronic guidance and tracking systems. GM plant will be located near Bendit at 2751-59 Riverside Dr., Los Angeles, Calif.
  - **Fire-fight increase in floor area** resulted from PCA Electronics, Inc., move to new building at 2150 Colorado St.,

Scotts Mesa, Calif. The company specializes in electronic pulse transmitters and delay lines and in computers, radar, and guided missiles.

- **Arise Tubes Under Test**—Ammunition Tube Inc. (Arise), has launched a program to check quantitatively the life expectancy of its recently developed line of ruggedized vacuum tubes under actual engine operating conditions. Six tubes used in the program will keep detailed records of in-use time to failure for 200 specially selected tubes of each Arise type. More tubes are expected to participate in program as expanded.

- **New Components**—
  - **Selenon relay** also operated by new-type relay solenoid provides fast, six-pole, double-throw contact action in a hermetically sealed unit only 1 in. by 1 in. long. Contacts will handle 10-amp. voltage load at 21-volt inductive load at 25 v. Mean bottom side relay mount and in case to sports circuit. MSA-B-1757. Philips Inc., Electroport Controls Div., 10 September 144 Drive, Fort Washington, N. Y.
  - **Maximum load** weighing less than 500 lb. requires less displacement at angles of 0.1 to 0.4 in. Manufacturer says device will withstand 50 G in direction of stroke and 50 G in any other direction. It is available with pneumatic, hydraulic, or spring return shafts. (Gelin Laboratories, 17 Court St., Morrisville, N. J.)

## Facts and Figures...

### FIGURE

The mind to this has something to do with "Wasserman"—what prices being their place in SAC to go, and what blonde. Ann Allen has just a few things on an IBM. One of the best of many things. She can't show, but her eyes, 18-year-old, 1875, 128 lb. square is maybe not on it.

### FACT

Five services performed in this winged world of men can compare with thousands. American engine overhaul is the complete fact and includes:
 

- **100 men** major shop is an authorized service station for both Pratt & Whitney, Avco and Wright.
- **Avco and Wright** (Aircraft).



### TAILCONE THERMOCOUPLES

New rugged, fast-responding thermocouples, shown being installed in tailcone of a PT-25-17 jet engine, are part of GLE's automatic engine control which regulates fuel flow to prevent excessive tailcone temperatures. GLE's Meter and Instrument Dept., which builds the thermocouples, says they are withstood 1,800°F temperatures and the tailcone. Automatic engine control is built by GLE's Automatic and Electronic Systems Division.

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And this year's Cessna 170—glorified for Flying's Golden Anniversary Year in the best ever. The all-metal propeller is standard equipment. There's a sleek new coving—bea-

tiful new striping—luxurious interiors—new instrument panel with more for 5 miles, 10 extra instruments—automatic oiler, heating-ventilating system. See your Cessna Dealer (listed in the yellow pages of your telephone book)—see the "Golden Year" Cessna 170.

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The A-C Control Panel includes an automatic voltage regulator, an exciter control relay, an exciter protection relay, and three differential current protection relays.



Aircraft automatic voltage regulator



Partially disassembled differential relay protection assembly



Circuit breaker (Cover Removed)



Exciter control relay (Cover Removed)



Exciter protection relay (Cover Removed)



Current transformer

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Westinghouse offers actual service-tested components for complete control and protection of a-c power systems. Exciter field relays, circuit breakers, differential relays, exciter protection relays and voltage regulators have accumulated millions of successful operating hours under flight conditions.

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## EQUIPMENT



1. FORCED DOWN in desert, KLM DC-4 escapes damage, save for . . .



2. BENT PROPS, but rescuers need . . . 3. INFLATED BAGS to free gear and . . .



## KLM Saves Sand-Bound DC-4 in Desert

(McGraw-Hill World News)

**Dubai, Saudi Arabia**—These pictures show how KLM Royal Dutch Air Lines, with a big assist from Arabian American Oil Co., salvaged a belly-loaded DC-4 from the Saudi Arabian Desert 17 mi. from Dhahran Airport.

The plane ran out of fuel when bad weather closed in its destination, Ras, and other alternate fields in the area. Only one engine was operating when the ship belled in. Nine of the 66 passengers and crew was injured.

► **Lifting It Out**—Starting with inflatable rubber lifting bags, flown in from Amsterdam with a team of four KLM

technicians and a Douglas Aircraft representative, the plane was raised high enough so the landing gear could be dropped.

The plane was on a slope and tended to slide around as it was raised. Thus the landing gear doors were bound to have been jammed by the belly loading. It took a day to free them.

Finally three American cranes, two using special fittings attached to the in-board engines, the other working on the nose, lifted the 40-ton aircraft and hoisted it on a giant lower-sliding trailer provided by Amoco. The KLM's powerful tractor moved across the loose desert sand, which had bogged down

most 25 would be stuck out (weather 35 did get through).

Additional problems were generated by a brick road which lurched the plane on its moving path, by an oil pipeline the trailer had to get over, and an electric power line it had to get under. But these hazards were passed and the aircraft was now rolled onto an apron next to Amoco's hangar. Tech teams helped to free the plane flying over, as the damage was slight.

► **How It Happened**—The DC-4, operating on a charter flight from London to Karachi with 55 passengers and a crew of 10 was flying the Ras-Adnan leg of the journey. There was "a stuck in" and



4. THREE CRANES to hoist plane onto huge Amoco trailer, with . . .



5. EXTENSIONS at sides to anchor wheels of disabled plane for . . .



6. MOVING OUT on four-mile trek for nearest road to the airport.



# MOTOR DATA

No. 125



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Torque 4.5 in. oz. at 5800 RPM



The power output of this precision motor is exceptionally high in proportion to its light weight and small size. Originally developed for constant speed and possible applications, the characteristics of its performance can readily be modified for a variety of new uses.

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- Completely isolated
- Algebraically for mounting
- Isolated field pole
- Balance steel shaft
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- Free balanced construction
- Permanent and plug adjustment

1600 FRAME MOTORS	Series	Shunt
Watts Output, 100	(mon.)	22
Watts Output, 100	(mon.)	3
Torque of 5800 RPM	(in. oz.)	4.5
Torque of 5800 RPM	(in. oz.)	3
Lock Torque	(in. oz.)	12
Watts Input	(in.)	5
Watts Input	(in.)	32
Short Circuit	(in.)	250°
Temperature Rise	(in.)	50°
Weight		12 oz.

**Eicor, Inc.** 1501 W. Congress St., Chicago 7, Illinois

BY MOTORS - INVERTERS - ELECTRONIC CONTROLS - ALTERNATORS - MOTOR

had no GCA facilities. After making several unsuccessful passes at the field, the plane proceeded southeast to Baghdad. When radio contact was established, it was to Baghdad the crew learned that this report also was worthless.

The flight was diverted to Dioban, 315 miles southeast of Basra.

Just before 2 a.m. on Jan. 2, in the lights of Dioban Airport shined through the darkness, the plane's tanks were running dry, and the engines started dying, one by one. With only one engine running, the pilot set the big ship down among the sand dunes. Only minor damage was done.

Alotted for DC's radio operator, a USAF plane received a distress and a message of the site within 20 minutes of the accident. They were followed shortly by an Air Sea Rescue Sea-see helicopter.

All passengers were evacuated to Dioban Airport from where they were flown on the same day to Karachi via other KLM aircraft.

## OFF THE LINE

More people use the expression "MOTO power" than ever to understand it. A quick check with engineers in the New York area showed that the engineering department of one of the large engine firms translates the phrase as "mass electric, hybrid power." The others did better. They all agreed it meant "integrated engine takeoff power."

A 26% jump in maintenance and overhaul work was performed by Lockheed Aircraft Service, Inc., in the first months of 1953 as compared to the same period in 1952. More than 950 commercial and military planes were handled in the 1953 period. At Burbank, approximately 55% of the company's effort was devoted to modification of jet fighters, 35% to overhaul and conversion of four-engine transports and 10% divided between executive-type aircraft and non-schedule work. At New York International Airport, 98% of the workmen were for line maintenance, modification and overhaul of four-engine transports, and 12% on maintenance of two-engine commercial transport and executive aircraft.

Dallas Aircraft's recent contract to overhaul Quon Airline's R1830 engines brings to its number of local service agencies who are Dallas' engine overhaul customers. The others: Clark, Luke, Conrad, Michael, Pioneer and Southern. Dallas' 1952 production showed a 125% jump over 1951.

# 20th Annual "Inventory of Air Power" COMING MARCH 2nd

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On-the-spot reports from Korea by American Week's correspondent will provide a picture of Military Aviation in action. This section includes design requirements data, information on the current program and production progress.

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With Avionics becoming the focus, the eyes and ears of today's Military Air Force, this constantly developing 100 percent Aeronautical Market will come in the special attention in the "Inventory of Air Power" issue.

### NORTH ATLANTIC AIR POWER

The NATO buildup in terms of Air Power requires additional and heavy loads upon our productive capacity. McGraw-Hill correspondents in the key cities of these nations will report on intercontinental nation's requirements.

### RESEARCH - What is the

Research budget? What are the chief areas of Research? What is the trend of expenditures? What new facilities are needed? The 1953 "Inventory of Air Power" issue will examine Aeronautical Research and report on these questions.

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weld and stainless steels as well as non-ferrous metals.

Pneumatic controls permit cautious one operation or automatic stop at top of the stroke. The machine can generally speed production by use of scroll forming or rolling operations. Both say in this, the work moves progressively over a series of dies, each die performing one of the steps. Since all dies are under the single ram, one stroke performs a number of operations. End loading, important in this operation, is facilitated by equipping the frame at both end ends of the machine. Bed lengths up to 12 ft are available.

The Carl Bels Co., 7045 Marlboro Ave., Cleveland 3, Ohio.



### Easy Access Door

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The unit's flush doors are released by a quarter turn of a screwdriver, and an additional quarter turn automatically raises the door out of the cockpit to remove.

These removable plates can facilitate maintenance and disposition of vital parts. Thousands of access doors now produced in 14 in. or various metals with weight from 0.33 to 1.15 lb.

Harbort Aviation Supply Co., 8035 Venice Blvd., Los Angeles 44, Calif.



### Drafting Simplified

Specialty Inset Drafting Graph sheets to help aircraft drafters do automatic drawings are being marketed by John R. Clifford Co., Inc.

The graph is based on an exact mathematical calculation and is part of

*Aeroproducts reports...*

# AEROPROPS KEEP GOING DESPITE SEVERE FLAK DAMAGE



OTTEWILLE 8 MAY 1950

Engineer (g) Robert C. Nore, USN, inspects the Aero-prop blade that brought him safely back from a North Korean trap. Flying from last summer's Task Force 77, he, Nore's AD flight-leader was hit by Red flak during a low level attack. A hole approximately 18 inches long was torn out of the trailing edge of the blade deep into the rib section. The blade remained intact and enabled him to reach a repair base. A new Aero-prop blade was installed without removing the propeller and the ship was returned immediately to combat.



OTTEWILLE 8 MAY 1950

Now Lieutenant Commander Lynde DuTemple knows why his AD *Idemaster* rised such a hole when he brought it aboard the USS *Perseus* off Korea. A 50mm enemy anti-aircraft shell had torn a gaping hole completely through one blade of his Aero-prop. Lt. DuTemple had just completed his fourth bombing run on a Hsin-chang railroad bridge when the flak ripped through his prop blade and shattered his canopy. The pierced Aero-prop blade did not start to perform enough to reveal the damage until the plane had reached its corner base.

THESE INSTANCES OF COMBAT DAMAGE EXEMPLIFY THE DURABILITY OF AEROPROPS . . .

THE Meticulous ENGINEERING AND CAREFUL FABRICATION OF ALL AEROPRODUCTS PROPELLER EQUIPMENT. THIS SAME SERVICE . . . AND THE "VISIONEERING" FOR AIRCRAFT OF THE FUTURE . . . ARE AVAILABLE TO ASSIST YOU WITH ANY PROPELLER PROBLEM IN THE SUBSONIC, TRANSONIC OR SUPERSONIC RANGES.



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### WHERE Are Teletypewriter Systems Used?

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Selectors keys permit complete system flexibility. Messages are received only by those stations chosen by the writer. All messages and selections are in the same handwriting as the original.

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Merch may be cold-treated at low pressures of —1000 and lower in a new line of industrial vacuum products by Weaver Vacuum Refrigeration, Tyrone, Pa.

The company says cutting lead time is boosted in work as 100°F by increasing lead time through cold treatment, distortion and cracking caused by grinding is eliminated, and dimensions of precision parts, gages and tools are permanently stabilized.

Factory tests also have shown that cold treatment aids expensive fitting and permits salvage of expensive parts, Weaver reports.

### Hydraulic Spring

A cylinder-piston, spring-actuated to produce 600% more power than conventional coil springs of the same construction has been developed for production machines by Widespring Corp., North Tonawanda, N. Y.

Known as the Wides Hydro Spring, the unit contains a compressible fluid that provides pressure up to 1,500 lb. The Wides Company's fluid, compressed for the spring, can be compressed up to 10% at maximum load. Lubricity has been taken into account in the fluid, the company says.

Hydro Springs may be used in hole-punching machines to return the die and strip away punched material. The springs also may be used in machine tools, plastic injection dies, and to cushion fluid lifts.

Most models of the Hydro Spring are no larger than 2 1/2 in., but the unit can develop pressure equal to that of a million coil springs, Wides says.



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Longer life for single-point tooling: carbide cutting tools is realized by sharpening at least four of diamond ratio and four more between carbide, according to Chicago Wheel & Mfg. Co., 1161 W. Monroe St., Chicago, Ill.

Increased tensile strength and better resistance to fatigue failure, especially has been achieved (with a reduction in weight) by means of new double-overlap construction in Fibram steel wire-reinforced flexible hose produced by American Ventilating Hose Co., 166 Park Ave., New York.

Locknut with aging steel insert that can be hot-dip galvanized to meet duct, sink water and other damaging elements has been introduced as #10 to #14 in sizes by Security Locknut Corp., North Ave. & 15 Ave., Melrose Park, Ill.

Recirculating valve that can be used for stream flow dividing of gas, air, salt water, oil and milk chemicals to pressures of 125 psi has been announced by John Mfg. Co., 540 N. Second St., Los Angeles 35.

Welding transformer giving stepless current selection from 50 to 375 amp. for a wide range of applications, from light duty, low-current sheet metal work to heavy duty, high-current industrial jobs, has been introduced by Central Electric Co., Schenectady 5, N. Y.

Rating table for machine tool work of 24-in. diameter can be rotated through 360 deg. in either direction and tilted to 90 deg. by publication. Size has reduced in mass when highest pressure is desired, providing accuracy as much as up to a 45-degree elevation, company says. Table is described as "an exceptionally compact" by Miller, Pratt & Whitney Division of Niles-Sweet Road Co., W. Hartford 1, Conn.

Portable, wide-range flow test kit for laboratory research and field flow-checking work is being marketed by Fischer & Porter Co., 743 Jacksonville Rd., Hatfield, Pa.

Battery ADXL, additive aid to potting lead and battery life, is made by Fluoroc, Inc. Fluoroc claims that can chloride ions made by MIT at request of Senate Small Business Committee approve process patentable under by National Bureau of Standards. Complete report is in Release SSB 189, obtainable from Senate Select Committee on Small Business, 131 Indian Ave., N. W., Washington, D. C.

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## WHY ACCEPT ANYTHING LESS?

## FINANCIAL

### Trusts Show Big Shift to Aircraft

Aviation Week study finds funds going heavily into airframe securities while dropping airline stocks.

AN AVIATION WEEK study of aviation and general-trust portfolios for 1952 reveals:

- Major shift to aircraft manufacturing shares.
- Liquidation of air transport securities.
- National—The most interesting account is presented by National Aviation Corp., the largest and most successful of the specialized aviation funds. At Dec. 31, 1952, net assets of this trust aggregated more than \$10.5 million, up slightly from the 1951 period to the highest point in the postwar period and exceeded only by the 1945 year-end valuation of \$13.3 million.

This valuation includes any contribution of dividends, totaling more than \$1.2 million or 59.45 per share, paid during the past seven years. The capitalization has remained unchanged throughout, with 446,476.66 shares outstanding.

Annual shares comprised 63.1% of the fund's total assets at Dec. 31, 1952. This rise from the 42.7% a year earlier helped boost the fund's assets held up to their highest concentration in the postwar period—aircraft securities.

Airline holdings, by contrast, down to 33.7% at Dec. 31, 1952, from the 52.2% of a year earlier, were at the lowest point in the last seven years.

Price Appreciation—The security portfolio had not soared \$4.1 million, but at Dec. 31, 1952, market valuation was \$6,645,325, reflecting considerable unfulfilled price appreciation. Aviation investment selected a much steadier unswerving enhancement, with a total cost of slightly more than \$3 million but a market valuation of about \$16 million.

During 1952, adjusting for all stock dividends, National Aviation sold \$60 Bell, 5,990 Grumman, and 500 Lockheed. Acquisitions were represented by 6,800 Bendix, 1,380 Boeing, 1,500 Douglas, 9,800 General, 7,990 North American, 5,000 Republic, 180 Thompson Products, 2,780 United Aircraft, and \$68,000 in notes and 10,000 warrants of the Glenn L. Martin Co.

Selling in 1952 was pronounced in the airline group, through liquidation of 7,500 American Airlines and 308 preferred, 15,000 Bonair, 9,000 Delta, 11,500 Eastern, 10,000 TWA, and 27,880 United Air Lines common. The only airline purchases were 2,106 Chi-

cago & Southern, 2,900 New York Airways, and 1,300 United Air Lines preferred. However, National bought \$145,000 of General Electric (now owned by BTRC).

National's Year-End Holdings—Giving effect to all of these transactions, National Aviation's security portfolio at year-end totaled and amounted at \$6,645,325: Bell, 6,800; Bendix, 7,500; Boeing, 10,000; Cessna Wright, 10,000; Douglas, 16,800; General, 8,500; Grumman, 24,700; Lockheed, 17,500; North American, 37,500; Republic, 8,500; Thompson Products, 20,000; United Aircraft, 508,080 in notes and 10,000 warrants of the Glenn L. Martin Co. A profitable specialty is further represented by 2,460 Genet-Henderson preferred.

From the standpoint of dollar value the largest concentrations were in United Aircraft (\$708,000), Boeing (\$704,775), and Bell (\$672,686).

Airline investments at Dec. 31, 1952, were represented by the following: 20,000 American Airlines and 10,780 preferred, 10,000 Bonair, 20,000 Chicago & Southern, 11,000 Delta, 11,500 Eastern, 18,000 Eastern Air Service, A, 500,000 Mail-Continent 47% debentures, 2,780 New York Airways, 25,000 Pan American, 15,500 United Air Lines common and 1,340 preferred. Total, 10,800 Air Express International Agency, Inc.

In the airline group the largest individual company dollar investments were represented by American (\$1,148,315), United (\$724,705), and Chicago & Southern (\$407,500).

High Dividends—An interesting aspect of National Aviation Corp.'s performance is the high dividend income derived by its stockholders. For 1952 and 1951, total dividends, amounting to \$2.46 per share annually, represent an average return of about 10% on annual market quotations of the National Aviation share. It is worth noting that this is a reflection of the high income-producing qualities of its portfolio, primarily the aircraft securities. (The return of liberal stock income yields was discussed in AVIATION WEEK Jan. 5, 1953, p. 13.)

While dividend and interest income average about \$524,000 annually for 1952 and 1951, or around 5% on its total assets, National Aviation demonstrated excellent results in achieving

capital gains during the last period. Profits from this source on a tax basis rose \$669,973 in 1952 and \$693,812 in 1951. Such favorable results appear to be more the product of good management than the liquidation of air-line devaluations which results in the industry.

Other Trusts—More diversification is not always a sure fire to successful aviation investments. For example, for a number of years Aerospace Securities, Inc., was operated as a specialized trust. Despite a wide variety of securities within the aviation industry, the results evidently led the sponsors of this \$1 million trust to liquidate and convert into a general type fund last November.

Another specialized trust still working is the Aviation Group of Institutions, which, with its assets of \$1.5 million, has this year aggregated about \$1.8 million, including 15% in aircraft shares and 15.1% in the airline category. Principal additions during 1952 included 1,900 Boeing, 2,340 Martin, 1,200 North American, 1,918 Douglas, and 2,710 Delta. Issues sold last year included 1,900 Douglas, 4,500 Fairchild Engine, 2,500 Northrop.

Among other airline issues sold were realized by 5,500 American, 400 Eastern, and 100 United Airlines were represented by 100 Capital and 508 Delta.

Average the general-type trusts reporting that far, the pattern has been to acquire a few aircraft shares while liquidating airline common.

The largest fund, Massachusetts Investment Trust, bought 1,490 Delta, 10,000 North American, and 11,000 United Aircraft during the last quarter of 1952. At the year-end this fund held a total of 16,400 Douglas, 66,000 North American, 35,000 United Aircraft, and 20,000 Grumman. Total MIT aircraft investments have a current market valuation of about \$5 million.

While other general funds are becoming less broad stock making trusts, nevertheless, there is no great change in this direction. Air transport securities, despite impaired initial earnings of recent years, are in demand because of their professional money managers representing general investment funds.

—Selig Altschul

### Stock Dividends Declared

Two airlines and three manufacturing recently declared regular quarterly dividends ranging from 10 to 35 cents for each share of common stock.

Stewart Warner Corp., Chicago, declared the highest dividend of 35 cents per share of \$7 per value capital stock. Other payees United Air Lines, 25 cents; Delta Air Lines, 25 cents; Aircraft, Inc., San Diego, 25 cents; and Ryan Aeronautical Co., San Diego, 10 cents.



# So. American Route Fight Up to President

- CAB turns over case for two parallel New York-South America interchange route agreements.
- But EAL-PAA group wants to re-argue Board denial of voluntary contracts between large carriers.

By Lee Moore

Decisions as to which airline shall get the right to go through service from New York to South America are now up to President Eisenhower. He either must approve or disapprove a Civil Aeronautics Board decision against permitting Eastern, Pan American and Togo to execute their equivalent interchange contract.

There have been no recent indications as to how the President will decide this case. It is controversial. Last President Truman approached it for a year and finally sent it back to CAB, although he left in office. Now CAB has moved it back to the new President. The Board does not want the Johnson job of negotiating the whole case, although the Eastern Pan American group has petitioned for re-negotiation.

In the so-called Balboa Service Case, the Board signs two parallel interchange route agreements: Eastern-Brazil and National-Pan American. Panama-own ships to bring exchange service from southeastern U. S. to various South American ports, and vice versa, between the airlines at Miami. The Board has denied approval of the voluntary agreement of Eastern Pan American and Panagra on grounds that it would weaken the larger companies. Eastern and Pan American-Panagra, in competition with National and Brazil.

The Board says it has power to deny such voluntary interchange agreements as a part of its public interest or "balancing" competitive route system. However, industry observers say that a final question is whether the Civil Aeronautics Act gets the Board power to deny interchange equipment charter contracts only on grounds too capricious to be argued.

► **CAB-White House-Texas** of the CAB decision and they transmitted to the President. He has not yet decided. But for about a year Washington was anxious have understood that the Board had ruled against the Eastern-Pan American Panagra contract. Confirmation of this fact was inherent in

petitions of these three airlines for arrangement of the one-after President Truman left office without having acted on the CAB decision.

The Board decision, if approved by Eisenhower, would an effort by to compel Pan American to execute a "voluntary" contract with National. The Board considered the convenience of the airlines. T. L. Wynn, who argued that the Eastern Pan American agreement should be approved, since he could see no other value of the public interest in an agreement. The Board denied Pan American's and CAB's petition for re-negotiation. Eastern filed its petition "after the Board had taken action," a CAB source said. Denial of Eastern's petition in some of the Board's opinion writing decision could proceed it was expected eventually but not.

The airlines now must deal directly with the White House in trying to make their case for and against the CAB recommendations.

► **Opposition.**—Pan American president Tom Uppig has been adamant in opposing CAB efforts to have PAA only South American routes. Eastern and National president G. T. Baker designed new interpretation of terms of a so-called interchange contract they had signed last year.

Pan American, Panagra and Eastern have submitted petitions for re-negotiation of the case on grounds the situation has changed since the Board made its original interchange decision. Both National and Brazil have grown in capacity, they say. National now is basically powerful and operates one of the most lucrative routes in the hemisphere. Brazil also has gained new size and potential through traffic pact and merger with Mac-Comet.

Furthermore, the initial decision of counselor Wynn ruled that a voluntary charter contract of this type must be approved unless it is found definitely contrary to the public interest. The burden of proof is on the Board, not the carrier, in airline charter contracts.

In effect, the New York-South America interchange agreements are

equivalent charters. Eastern and National carry passengers to the Miami gateway to Latin America. They land and refuel, then Brazil and Panagra cross by the same planes on to Balboa and points south. The planes start stop at Miami never, in this one-plane arrangement, is little different from an exclusive transfer of passengers to another plane. The through trip is so long that little if any equipment is true or connections is gained through interlining.

Main advantage is increased protection and advertising of the complete service, since National and Eastern could now advertise that it is effect that their own carrier to South America, and the Latin American operations Eastern could new generic "direct" service to the U. S. East Coast.

► **Denial.**—Senator Washington observed last week that President Eisenhower would follow the recommendation of the Board and approve its decision. This means that the new President and his White House staff now have with more important matter to give concentrated study, to the Board decision. CAB Member Chairman, former chairman of the Senate Aeronautics Committee in the 80th Congress, visited Eisenhower's residence at the White House to brief him on Board affairs, personally including this one.

However, some other observers believe the White House should still deny action, as the former President has said. He has still said that this case is now likely to do that if they consider the case would be against Wynn's recommendation. But some observers think that denial of voluntary agreements in this case would be unwarranted or because of government control.

## Large Nonsked Orders DC-6Bs for Aircorh

North American Aeronautics Division, largest domestic aircraft manufacturer, has placed a firm order with Douglas Aircraft Co. for two DC-6Bs with backward-facing passenger seats, the first such order in the U. S. airline industry. Delivery date late 1959.

The carrier also is the first domestic airline to order new coach planes, except from the factory. Other airlines, except Pan American, have

converted older first-class planes to coach.

North American now will operate five DC-4s, but plans to order more DC-6Bs if it wins a route certificate from CAB. The North American agencies currently gross nearly \$1 million a month in aircraft revenue.

## CAB Starts Action On United Aircorh

Civil Aeronautics Board last week started formal enforcement proceedings against United Air Lines for "unfair competition" in offering what CAB considers restricted DC-4 service (lower than 40 seats) to coach fares in violation of the carrier's filed tariff (American White Paper S. & P. 75).

But UAL president W. A. Peterson told WASHINGTON WEEK he will continue operating his present DC-4 coaches "indefinitely." And it will be at least six months before CAB can issue a final command-and-control order that will stand up in court because of time acquired for briefs and hearings. If the board were to issue such now, the airline could claim CAB moved arbitrarily, without a hearing.

However, the board is expected to issue the command-and-control order this summer. United then can appeal the decision to a U. S. Court of Appeals and petition for stay of the order pending court review. If the court does not grant the stay, United immediately must stop DC-4 coach service altogether or comply with CAB's order concerning at least 54 passengers (seats) on DC-4s to north coast ports.

► **Panama-Panama.**—A United spokesman told WASHINGTON WEEK that "in particular work, it is on progress" to modify the carrier's DC-4 coaches from 54 seats to 35 seats—still not less than required by CAB. That is taken to be Board evidence as an indication that United has no intention of abandoning its stand.

Peterson recently and a congressional investigation would be a good way to settle the question of whether high density seating is unfair, as he alleges that last week, he told WASHINGTON WEEK that he had not directly suggested such a hearing through his congressional, and that he does not "expect" a congressional hearing.

## Pioneer Exchange Report

Pioneer Air Lines gave \$1,765,457 in airline exchange contracts last year and received \$2,920,649, according to reports at a recent PAA, after meeting in Dallas. American Airlines received \$584,585 from Pioneer Airlines, \$108,865 from BAA, \$182,191, and Delta, \$118,795.



BEAN'S FIRST production model of the turboprop Viscount flies in the air in 1955.



VICKERS concludes production of the turboprop, with an eye on U. S. market.

## Vickers Pushes Viscount Sales

With 75 orders firm up, British manufacturer plans vigorous bid for customers among U. S. carriers.

London.—An accelerated international sales campaign for the Viscount turboprop airplane is being pushed by Vickers-Armstrong Ltd.

With a total of 75 firm orders already in the books and a more order still being placed, the Viscount is becoming the most profitable of the British gas-turbine-powered airplanes for U. S. airlines in the international airline market.

Indications are that Vickers is concentrating its current sales campaign in North America where Trans-Canada Air Lines already has ordered 15 Viscounts and BAA has ordered three more for its dollar-denominated West Indian service traffic.

► **Fast View.**—U. S. airline officials will get their first glimpse of the Viscount this winter when Vickers sends a production model to Canada for

cold-weather tests of winterization modifications for Trans-Canada's operations. Inquiries later, Vickers is expected to bring another Viscount to North America for a full-scale sales campaign including a U. S. premiere.

U. S. airline principals will get their first glimpse of the turboprop-powered Viscount in regular airline service on TCA's routes into New York, Chicago, Cleveland and Seattle sometime early in 1955. BOAC is expected to put its Viscount into West Indian service during the same year. Only U. S. port to go service by British West Indian Airways is San Juan, P. R. Recently George Edwards, Vickers chief designer, declared that the Viscount production program was being accelerated to a rate of eight a month by mid-1955 in addition to the Westbridge production line. Vickers is now building major components at its

## Vickers Announces Super Viscount

(McGraw-Hill World News)

London—Vickers-Armstrongs, Ltd., unveiled plans for its Super Viscount last week with announcements that British Overseas Airways has ordered 12 air delivery in October, 1955.

The Super Viscount, designated the 840, will have a fuselage 13 ft longer than the Viscount, boosting passenger capacity from 45 to 55 seats, at 52 high density.

Gross weight was increased from 55,000 to 65,000 lb. This was made possible by increasing nose power unit of Rolls-Royce Dart engines, the new RD53 will give 1,540 shaft horsepower and 4,600 equivalent horsepower.

► **Highly Efficient.**—BEA has an option for eight more 840s. It plans

to use them on short hauls—Paris Amsterdam weekly. BEA intends the 840 will replace the Viscount probable on short routes, while the present 700 series is concentrated only on 500 to 800 mi routes. This new redesign of the Viscount 840 will be a replacement for the airline's 250s before destined for India.

Original goal of fitting Darts to the Elkhedon has been dropped long after the lack of loading.

Orders for Viscounts now total 50. Vickers plans to produce the 700 and 800 series side by side, realizing that there will be increased demand for both.

Changes in present British practice in the first development costs of the Viscount 840 series are being undertaken solely by Vickers, not by the Ministry of Supply.—N. M&E.

them finally and eventually plans to set up a second line there.

Meanwhile, Vickers delivered its first production line Viscount to British Overseas Airways last month, several months behind schedule. BEA had expected to have a small quantity of Viscounts in service to handle its Caribbean route traffic with regular monthly flights and began regular Viscount service in the spring.

► **Repair Problem.**—Schedule now calls for BEA to get first Viscounts by Apr. 1, with first deliveries to Air France beginning shortly thereafter. Possible cause of the delivery delay has been difficulties with the propeller because bearings in the Rolls-Royce Dart turbo-prop. Rolls now has developed a capital bearing that is expected to solve the problem.

During the development cycle the gross weight of the Viscount has risen from 55,000 lb. on the prototype, to 55,500 lb. on the current production model. Loading capacity has increased from 50 to 56, with a 54 high density arrangement possible. Power of the

Dart turbo-prop has risen from 1,300 shaft horsepower to 1,400 in the current model, plus 365 lb. of jet thrust. In a special long-range version of the 52,700-lb. gross weight developed for Trans-Canada Airlines, the Viscount is expected to carry an 8,700-lb. payload over a 1,700-mile stage length.

► **New Features.**—Special modifications for Trans-Canada's cold-weather operations include additional electric power, better heating systems for passengers, new and bright compartments, and methods of minimizing the effects of shock and air illness by restricting the landing gear during flight.

Vickers also is considering a freight version of the Viscount at the request of three prospective customers.

Since the Viscount prototype made its first flight in July 1948, a total of 2,100 hr. have been flown in it, the production prototype and the first production model delivered to BEA.

Additional Viscount sales are currently being pushed in India, Germany and Holland in the face of strong G. S. competition.

trans-Atlantic air cargo a policy proposed by Pan American. In 1945, advocating low-fare, heavy-volume trans-Atlantic passenger flight. When set aside with effect last year, trans-Atlantic passenger volume jumped 35%. TAA expects the same action for freight.

► **Based on Bell.**—Introduction of Douglas DC-6A airframe, with a landing gear in nose, a single main gear and capable of carrying 25,000 lb. loads, makes an shipment of large, bulky cargo possible.

Current trans-Atlantic cargo traffic

provide two rates—one for shipments of more than 100 lb. and the other for less than 100 lb. For the TAA's proposal, according to airline observers, will be additional "break points" for shipments of 500 and 1,000 lb.

Industry sources say Pan American will call for a 45% reduction in rates for shipments of more than 1,000 lb. This means bulk cargo lots shipped from New York to London would cost 60 cents a lb., almost cutting in half the current rate of \$1.16 a lb. Small shipments would remain the same, but the low bulk rate would encourage shippers to consolidate small lots.

► **South American.**—Latin Gate—TAA has been looking closely to South America at rates lower than surface transportation for the past four years, airline spokesmen say, and the low cost has encouraged shipments of more than 1,000 lb.

Informed sources say Pan American will make this proposal at a meeting of IATA's special Airfreight Commodity Rates Board, composed of senior traffic officials of the North Atlantic Conference of Airline Operators, to meet in New York Feb. 15.

## Flying Tiger Service Speeds Parcel Post

Flying Tiger Line is handling parcel post packages for long-distance shippers in a new air service competitive in cost with regular rail rates.

The cargo carrier says that fastest parcel post delivery time in bulk, yet at least only 5 to 5 cents per pound since then straightened out.

E. Kraushaar, western regional vice manager, says 76,000 lb. of parcel post were flown from San Francisco to Seattle, Chicago and New York during the last 22-day period of the season.

The line anticipates a daily load in the San Francisco area of from 10,000 to 20,000 lb. in packages from garment manufacturers, who recently opened the service through an endorsement by the Apparel City board of directors.

Working with a consolidator, Flying Tiger subdivides packages within one size and length of parcel post to the shape they require the point of destination. The network is carried on its first leg by regular parcel post.

The consolidation—Air Land Freight Forwarder—picks up parcels, weighs and sorts them, and meters the packages with the postmark of the city where parcel post takes out delivery at the package.

Flights, operated with a small volume of shipping between San Francisco and San Diego before the service was extended to include Denver, Chicago and New York. Flare new call

for parcel post flights in Los Angeles by the end of March.

Kraushaar says the line received a 50% response from shippers at San Francisco on mailed advertisements of the new service.

## CPA Plans Polar Run

Canadian Pacific Airlines plans to make application now for a route to open across the Canadian polar route from Vancouver to London, the carrier's president, Grant McCoschke, stated recently.

And by employing the polar route, he said, CPA can connect Asia and Australia to Europe. South America also opens in this plan. McCoschke also believes that "by the end of this decade we can expect to see 50 passenger kilometers in the air."



## NEW FRENCH TRUCKS TESTED

French activity in the transport airplane field is highlighted by these two pictures of their most recent developments. Top photo shows the new Nord Nordeco H1D H-1 shift and the lower one is the first photo of the G.O. 56 Bataan fitted with two Saurat air turboprops. Noteworthy feature of the H1D H-1 is the high aspect area wing (332). Powered by two 400-hp. Wright GT360 engines, gross weight is 25,032 lb. and top

## Capital-Western Merger Talks Denied

A swing around the West Coast last week by Capital Airlines president J. H. Caronchick gave rise to rumors of merger discussions between Capital and Western Air Lines.

But Capital executive Ray Lockard told Aviation Week he had no knowledge of such discussions. Sales vice president J. W. Austin accompanied Caronchick on the trip, Lockard said, and the merger subject of discussion was entirely aside.

Civil Aeronautics Board recently granted Western a route extension to Minneapolis-St. Paul, among five systems with Capital for the first time. Industry observers indicated that Capital talks merger with Northwest Air Lines rather than Western.



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## No Shortcuts

- CAA stands ground on Comet 3 certification.
- But more meetings will be held later in Britain.

By Alexander McNulty

Efforts of the British Air Register to have Board to shortcut some Civil Aeronautics Administration red tape in connection with U.S. certification of the Comet 3 jet transport were unsuccessful. It was indicated last week in Anglo-American meetings were held in Washington.

However, the meetings will be resumed later this year when CAA's 13-man Turbine Transport Evaluation Team, headed by George W. Halden, CAA chief of aircraft engineering, goes to England.

• **Confidence Procedures**—CAA administrator Charles F. Hume announced a three-point procedure the U.S. has set for acceptance of "specific British designed and manufactured turbine-powered aircraft as an independent basis similar to that contemplated for U.S. manufactured aircraft." These are the points:

• Assurance by the Air Registration Board that the supplier complies with certain technical standards to be mutually agreed upon.

• Supplying the U.S. government with design data covering other aspects of the airplane that are not dealt with by the agreed standards or to which the agreed standards logically cannot be applied. Concerning these items, it would be necessary for CAA to make such decisions on an acceptable level of the general level of safety to be applied to domestic manufacture.

• Examination by U.S. technicians at least one of the turbine types during actual operation and under specified conditions.

• **"Trustful Exchange"**—Hume's announcement quoted him and R. E. Harrington, head of the British delegation, as telling the meeting a "trustful exchange of technical information."

Harrington told American Wires: "We have agreed on a number of things. But that is not to say that there have not been many other points of disagreement."

"The main trouble," Harrington told, "is that we do not have a Comet 3 ready for the CAA to flight test. All that is available now is a Comet 1."

The British leader, who is secretary of the British Air Registration Board, indicated disappointment that the Washington talks had not made more

actual progress toward clearing blocks in the way of Comet certification. The Comet 3 has been ordered by Pan American World Airways. British delegates had hoped CAA would agree to outline an agreed U.S. requirements above the British certification requirements and allow the British agency to certify that these requirements had been met.

But the third point in Hume's procedure before entering CAA is not having to meet on its independent flight test of the airplane, in addition to everything the British now do on the plane.

Hume described the Washington meetings as "part of a careful procedure aimed at mutual agreement on standards for U.S. certification of the advantages of jet transport, such as the British Comet."

• **Final Agreement**—After similar prior discussions, Hume and CAA agreed to accept British certification of incorporating engine aircraft, stating first these complied with British requirements and such certain stipulated U.S. requirements as addition. The de Havilland Dove, and two-engine transport, is the only British airplane

that has been certified for use in the U.S. under this agreement.

The official statement from Hume stated both the CAA administrator and Harrington, in reaffirming a mutual confidence in safety standards of the two countries and emphasizing that, "Under stress on detailed technical requirements, progress from national practices other than the standards of safety, would not be permitted to obscure this mutual confidence."

• **Comet Criticism**—Harrington and his three technical specialists were part of the Washington session, Institute of the Aeronautical Sciences, during their Washington stay. At a meeting on turbine transports, the AIB members, first, gave their own U.S. government, industry and military leaders' statements about jet transport and the Comet in particular.

Discussion centered on the numerous U.S. government, commercial and private bodies that have been studying papers on the jet transport question while the British have been setting itself.

It appears you've spent too much time in conversation, the British official commented.

A statement by Lt. Gen. Joseph

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and Airline; Ralph Mangham, interline sales manager, American Airlines; E. L. Demarest, vice president of interline sales for UAL; Kenneth Bell to right, and J. M. Kings, vice president of government sales, DCA; M. Wilkins O'Neil III, manager interline relations, Capital Airlines; Harry Vanderlin, assistant to the director of agency and interline sales, TWA; and G. H. MacDonald, vice president of airline sales staff.

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South, Military Air Transport Service commander, that the Comet is an "any-weather" airplane, and other remarks by Adm. DeWitt C. Ramsey, Naval Air Station Area president, and Brig. Gen. Milton Arnold, Air Transport Army vice president, led to Hush-aby's remark that after listening to them—he supposed—should be considered the Comet should show three Comets in the skies. "But he stressed the group this would not be done."

Hushaby's great experience on Comet jet engines showing the transport's features were more reliable than piston-type powerplants on other four-engine planes operated by British Overseas Airways Corp. He reported that engine overhaul time was on trend in 450 hr. Gen. Arnold had stated that the jet engines were not yet as reliable as piston engines.

## CAA Builds Traffic Control Test Center

A program to evaluate new air traffic control equipment under actual operating conditions at the CAA's Technical Development and Evaluation Center at Indianapolis has been announced by the Air Navigation Development Board.

Scheduled to begin operation in July, a new evaluation and control center now under construction will permit the first controlled tests of such new "automation system" developments as air traffic data displays, data transfer and storage units, and remote radar displays.

► **New ARTC Establishment**—A recently established Air Route Traffic Control center, composed of traffic control centers previously assigned to three other ARTC centers, will be housed in the same room as the evaluation center. ARTC controllers will operate from the regularly-scheduled hall of the new center until new equipment is ready for evaluation in the other hall. Then one or more controllers may move to the evaluation hall for trial under actual operating conditions without jeopardizing flight safety.

► **Bell Labs Participates**—Bell Telephone Labs and Western Electric engineers, under ANDB contract, will develop better integrated communication systems and improved controller consoles, with particular emphasis on the "human engineering" aspects of design. All communications Bell will work on communication systems capable of meeting future ARTC needs.

Industrial designer Henry Dreyfus, Ohio State University, and the USAP's Aero-Medical Lab also will participate in studies of the effects of noise, lighting, and work schedules on controller fatigue and operating efficiency.

## SEARCHLIGHT SECTION

(Continued from page 1)

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## SHORTLINES

• **Air Transport Assn.** is making a study that may show facilities used by air would both pay the Post Office and spend money on discounts of more than 400 m. . . . ATA also is pursuing airline financial and pricing data for CAB's upcoming general fare investigation.

✶ Air Line Pilots Assn. asks CAB to suspend investigation of the Pan American World Airways' DC-6 crash off San Juan last April. CAB blamed Capt. John Boren's alleged "permanant action" in attempting to re-establish a climb, without using all available power. ALPA says the facts do not bear this out, and Boren has "an excellent record as an airline pilot."

► Airwest plans weekly service between Baguay and Casaca with Air France as first step toward extending service to Europe with Air France.

Company volume gained 47% in 1952 to 41,266 passengers, partly due to a route extension from Phoenix to Los Angeles.

■ **Brundt Always** has issued its annual regional business, population and income analysis of "The Greater Brundt States of America." The analysis now includes the merged Mid-Continent Airlines states, termed "the new un-state area annexed to the Brundt States of America."

• **British European Airways** predicts the new European coach services starting Apr. 1 will boost BEA annual traffic by 40% and revenues by 15%. BEA carried 1,336,000 persons in 1952 and this year will offer 90% of its capacity at coach rates.

• **British Overseas Airways** reports its jet Concorde carried 15,800 passengers the first eight months in service, starting last May. Company now has 251 fully trained jet air crewmen for its Concorde fleet. • **BOAC** reports that its passenger volume gained 13% last year.

• **Civil Aeronautics Board**, in a new "airweight breeder case," will ask a regulatory policy for all indirect carriers—freighters, shippers' associations and shippers' cargo agents "with suitable regulation to ensure fullest development of each class."

★ Consolidated Flower Shipments, Inc., nonprofit association providing an overnight service to San Francisco Bay area flower growers and shippers exclusively, is ordered by CAB to "cease and desist from engaging indirectly in air transportation." CAB says that regardless of its nonprofit, nonpublic character, the company is a common carrier within the meaning of the Civil Aeronautics Act, operating without letter of registration or other authority.

• **Consolidated Valter** reports production and delivery of two more Comstar 400s than the eight originally scheduled for January—one to Comstar and one to Russell. Scheduled deliveries: United 3, Russell 1, Delta 2, Aero O/Y (Rough Air Lines) 1, Post & Whitney 1. Comstar also delivered its prototype to Phillips Petroleum.

Company has started three daily nonstop New York-Miami DC-6 coach flights, plus two DC-6 night coach services. DC-6 conversions to coach was made possible by recent delivery of eight DC-6Bs. The DC-6s cost com-

► **Part of New York Authority bus fleet** will be sold, says DOT. The DOT is planning to sell 100 buses from the fleet to help pay for the DC-60. Price ranges \$44 plus tax. Company switched New York operations to Midland Feb. 1 "in the interest of greater schedule dependability."

► **Pan American World Airways reports**

► **Postage flight** when shipping direct across July 1, 1946. The 585,000 postages saved combined total of Puerto Rico's 44 largest cities. Volume in 1952 showed an increase to 90 flights a week.

► **Time World Airlines'** January domestic traffic gained 33% from a year ago to 164,662,062 passenger miles. General sales manager C. S. Falkenstein attributes the sharp rise here to increased competition.

TW/C&S interchange service Houston New York via Pittsburgh starts Apr. 1.

## WHO'S WHERE

(Continued from page 31)

lected to the board of directors of Bell Aircraft Corp., Buffalo, N. Y.

**William B. Becker** is the Air Transport Ass'n's new director of operations.

**John W. Mosen**, former engineering chief at the Naval Air Test Center, Patuxent, Md., has joined Dornier Helicopters, Dan-

**Robert P. Shumwood** has been appointed director of the monthly Journal of Health Politics, Law, and Ethics. He is currently professor of engineering and director of the Center for Health Policy Studies at the University of California, San Francisco.

**Chk First H. Krenner, USAF (Ret.),** has joined *Glenn Company, Douglas, Cal.*

Joseph Peirone has been appointed chief of the new Products' Design & Development Division, Adams Corp., Newark, N.J.

Leonard J. Perry has resigned from Pan-Atlantic Freight and Airlines Corp. to its charter service Ft. Lauderdale, Fla.-Miami, Fla.-San Jose.

George F. Schroeder has been named act-

John E. Casadei has been promoted to associate director of public relations for the U.S. Coast Guard.

and Don H. Cameron has been appointed director of industrial relations.

Ken M. Caspell has been promoted to assistant manager of the San Diego Chemical Division Sales Activity Co. William F. Coyle is new head of aircraft and engine contracts.

Conrad H. Jones has been named director of advertising and public information of

### Honors and Elections

Dr. John V. N. Gargner, Soudard Research Institute, has been named the "outstanding young electrical engineer of 1952" by the IEEE, New York.

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AVIATION WEEK—FEBRUARY 16, 1953

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## Planning a Safe & Sane Air Show

We congratulate the management of the sixth annual aviation exposition to be held next July in Detroit. Neither that city, nor aviation, wants more publicity like last year's example shown above. They have sensibly ruled that the following will be excluded from the program:

1. All types of air racing
  2. Highspeed games
  3. Close formation flying
  4. Aerobatic stunts, whether civil or military
- Instead of indulging such risk on things personnel and spectators on the ground, the program will stress such constructive attractions as:
1. Ground exhibits of both civil and military aircraft
  2. Ground exhibits of seaplanes and amphibians
  3. Controlled-flight demonstrations, emphasizing safety and skills
  4. The departure and arrival of significant civil and military long-distance flights
  5. Deals with appropriate aviation television programs, local and national.

Such a constructive program will set the best possible theme for this year's exposition, "Wait Aviation Does for You—Citizen, USA," during the 50th anniversary of the Wright brothers' first flight.

The DETROIT CONFERENCE has made a courageous decision that should set a new mark in information affairs, and in the right kind of publicity for aviation. Jack Korte is chairman. James Vette is managing director. Lawrence Ziegler is chief of operations, and E. T. Peckley is deputy chief of operations. They and their backers and associates deserve the thanks of an industry that is trying, conscientiously, constantly, to meet the needs of the public for safe transportation. Unnecessary stunts and risks to life and limb belong to another age, gone forever.

## Less Secrecy About Korea

A significant public statement made a few days ago by the commanding general of the U.S. Far East Air Force deserves more attention than it has received generally.

Gen. O. P. Weyland told the press that our Air Force estimates the Red's combat air strength at 7,000 planes in the Far East.

He says the Soviet Union alone has 4,500 available combat planes, while the Chinese Reds hold another 2,500.

This estimate is several times larger than earlier official reports that had been made public.

Thus, after months of rumors, Gen. Weyland confirms a stream of private reports that have been brought back from Japan and Korea by returning military people, newspaper men, and other sources.

Some of these rumors have placed the total Red strength at more than 7,000 planes.

These returning citizens were not discussing up their own estimates. They were bringing back lists from authoritative sources which could not be attributed officially and released through Air Force information channels because of "secrecy."

Just what branch of U.S. security was involved in taking the Reds here many aircraft they had a most questionable, but the fact remains that there have been mistakes—such as the Red air buildup—when the Air Force has been blocked by high government officials, for political reasons, from telling important facts about the air war.

Some interference on lower levels has come from questionable judgment of some Air Force officials in determining information that can be released. And "secrecy" frequently disappears as a barrier to even when aerospace today sees its head in a search for publicity and headlines.

The Truman Administration never faced up to its public responsibility by telling us the size of the air forces our own men and our Allies faced.

The Reds, with their intelligence service and their constant aerial surveillance of our entire building area, have known more about some important phases of this war than most U.S. officers. Why?

It is to be hoped that Gen. Weyland's announcement is a realization that the Eisenhower regime intends to tell the public more of the facts we deserve to know.

—Robert H. Wood

## Flying Tomorrow's Jets



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This modern fastener drives easily into standard holes, compressing as driven. Its spring action locks it in place—regardless of impact loading, stress reversals or severe vibration. Rollpin is readily removable and can be re-used in the same hole.

\* \* \*

*If you use locating dowels, hinge pins, rivets, set screws—or straight, knurled, tapered or cotter type pins—Rollpin can cut your costs. Mail our coupon for design information.*



as a rivet

# ROLLPIN

TRADE MARK



a hinge pin



a dowel



a set screw

Elastic Stop Nut Corporation of America  
Dept. R16-225, 2330 Vauxhall Road, Union, N. J.

Please send me the following free fastening information:

☐ Rollpin bulletin

☐ Elastic Stop Nut bulletin

☐ Here is a drawing of our product. What fastener would you suggest?

Name \_\_\_\_\_ Title \_\_\_\_\_

Firm \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_